Supplemental Material

CBE—Life Sciences Education

Styers *et al.*

BI 125: Cell and Molecular Biology – Fall 2015
Birmingham-Southern College
Course Syllabus

Lecture Instructor: **Dr. Melanie L. Styers**
mstyers@bsc.edu
SSC 245, 226-4882

Lectures: MWF 12:30–1:00 pm, SSC 138

Laboratory: T 12:30–3:20 pm, W 2:00–4:50 pm, or Th 12:30–3:20 pm, SSC 215.

Office Hours: M 3:00–4:00 pm, T 10:00–11:30 am, W 10:30–11:30 am and 2:00–4:00 pm, or by appointment.

Lab Instructors: Dr. Melanie Styers (mstyers@bsc.edu)
Dr. Jessica Grunda (jmgrunda@bsc.edu)

Required materials:

1. **Symbiosis: The Pearson Custom Library for the Biological Sciences** (ISBN10: 1256194468; ISBN13: 9781256194460), comprised of selected chapters from **Campbell Biology, Ninth Edition**, 2011, J.B. Reece, *et al*. Pearson Benjamin Cummings, San Francisco, CA. (ISBN10: 0321558235; ISBN13: 9780321558237).
2. **Cell and Molecular Biology Laboratory Manual**, Fall 2015, Styers and Pezzementi, Birmingham-Southern College: Birmingham, AL
3. Clicker, Turning Technologies (available in the bookstore)
4. Student Lab Notebook (with spiral binding; 50 carbonless duplicate sets) by Hayden McNeil
5. Scientific calculator

Course Description: Welcome to Cell and Molecular Biology! This classroom and laboratory course seeks to challenge you and stimulate your interests in cell and molecular biology. Success in this course requires the *synthesis* and *application* of knowledge of the molecular and cellular nature of biological processes. Throughout the lecture and laboratory, you will learn to apply the scientific method to important questions relevant to the field of cell and molecular biology. We will build from and understanding of the basic molecular nature of cells to an exploration of various cellular processes. Our studies will begin with a treatment of the chemical nature of cells and the major molecules and macromolecules that permit cell function. From there we will explore in some depth each of the four classes of biomacromolecules – proteins, lipids, carbohydrates, and nucleic acids. Once we have built this foundation, we'll look at how these macromolecules work together to control cellular processes such as DNA replication, gene expression, cell division, energy production and utilization, intracellular compartmentalization, vesicular trafficking, cell signaling, and cell movement. Throughout the semester, we will also focus on how these processes are linked to human disease.

Course Goals: By the end of this course you should be able to:

- define and use the vocabulary of cell and molecular biology
- articulate and apply the fundamental concepts of cell and molecular biology
- examine and interpret the experimental basis supporting generalizations about cells and biomacromolecules

In addition, this course is a designated Scientific Methodologies course in the Explorations curriculum. Therefore, by the end of this course, you should be able to

- use the scientific method to address fundamental questions in cell and molecular biology
- define a problem and clearly communicate an appropriate rationale for investigation
- develop testable hypotheses and design experiments to test these hypotheses by employing laboratory techniques common in cell and molecular biology
- collect and analyze quantitative and qualitative data and draw appropriate conclusions
- communicate effectively with the scientific community by writing a scientific research paper, based on research in the library integrated with research in the laboratory.

These outcomes should greatly enhance your critical thinking and quantitative analysis skills.

Expectations: To achieve the goals described above, each student is expected to

- abide by the Birmingham-Southern College Honor Code (see below) and all other College policies
- be dedicated to and accept the challenges presented
- read assigned text and watch assigned videos in advance; prepare for, and actively participate in class and lab activities
- be an active participant in your education – ask lots of questions
- be honest, responsible, reliable, and hard-working
- complete, with outstanding work, exams, quizzes, assignments, and laboratory activities
- present, in written form, the laboratory projects, and
- respect all peers and instructors involved with this course.

Course Policies:

1. **The Birmingham-Southern College Honor Code:** All students in this course are expected to maintain academic integrity and uphold the Honor Code at all times. **Specifically in this course, the following are considered violations of the Honor Code: collaborating on work assigned for individual completion; using unauthorized resources in the completion of exams, quizzes, and assignments; failure to report the Honor Code violations of other students; plagiarism; turning in work that is not your own; lying, stealing, and lack of adherence to the instructions on any examination, quiz, assignment, or course policies listed below. For laboratory, it will be considered a violation of the Honor Code to look at a previous student's BI 125 lab report. Both the current BI 125 student and the student who shared his or her paper will be considered to be in violation of the Honor Code. Therefore, you are expected to keep these papers to yourselves and not share them or place them in any test files.** Any violation of the Honor Code will be reported to the Honor Council and will result in a zero on that assignment. Penalties imposed by the Honor Council are frequently academic probation, suspension, or expulsion.

2. **Attendance & Participation:** Successful completion of this course requires active participation. Therefore, attendance in the classroom is strongly encouraged. Attendance and participation in lecture will be scored by answering clicker questions during lecture (see below). Attendance and participation in the laboratory portion of the course are mandatory and will also contribute to your final grade. You are expected to be on time and

to stay for the duration. If schedule conflicts arise, please discuss them with your instructor *in advance of the conflict* so alternate arrangements can be made.

3. **Learning Accommodations:** Under the directives and guidance of the Americans with Disabilities Act (ADA) and Rehabilitation Act of 1973, we are committed to providing appropriate accommodations to meet the learning needs of all students. If you are registered for accommodations, please make an appointment with me as soon as possible to discuss accommodations that may be necessary. During this discussion, you are not expected to disclose any details concerning your disability, although you may discuss these details at your discretion. If you have a disability but have not contacted Jason Peevy, the Disability Accommodations Coordinator at BSC, please call 226-4717 or visit Counseling & Health Services on the second floor of Norton Center, next door to Student Development. You may also contact the Coordinator at jpeevy@bsc.edu if you have any questions or need more information.

4. **Communication:** Your class instructor's office hours are M 3:00–4:00 pm, T 10:00–11:30 am, W 10:30–11:30 am and 2:00–4:00 pm, but please feel free to set up an appointment if you have class during those times. Both email and Moodle will be used to communicate important information about the class, so you are expected to check your BSC email frequently.

5. **Cancellations & Time/Location Changes:** If class is cancelled or if there is a change in time or location of class for any reason, an email announcement will be sent and posted on Moodle and a sign posted on the classroom/laboratory door as soon as possible. In the event that class is cancelled, you will be expected to complete any assignments due.

6. **Cell Phones**: Use of cell phones and/or related devices (to send or receive calls, text message, surf the internet, etc.) is not allowed in the classroom or the laboratory. Such electronic devices should be turned off at the beginning of each class and lab meeting (including exams!), so that they will not ring, vibrate, or otherwise disturb you, your fellow students, or your instructor.

Course Work & Evaluation

Letter grades, as defined in the BSC Catalog, will be assigned at the end of the course based on the number of possible points that you can earn, where 93-100% = A, 90-92% = A-, 87-89% = B+, 83-86% = B, 80-82% = B-, 77-79% = C+, 73-76% = C, 70-72% = C-, 67-69% = D+, 60-66% = D, <60% = F.

Summary of point distribution:

Exam 1	125
Exam 2	125
Exam 3	125
Final Exam	150
Quizzes (10 of 11)	100
Lab Report Drafts	60
Final Lab Report	150
Pre-Labs/Lab Conduct	55
Writing Workshops/Exercises	45

Experimental Design/Data Analysis Exercises	50
Participation and Clickers	15
TOTAL	1000

Examinations: Three in-class examinations (worth 125 pts. each) and a cumulative final examination (150 pts.) will be given. You are expected to take all exams on the dates and times scheduled. If an exam is missed due to extenuating circumstances, i.e., *documented and Provost Office-approved* medical or family emergency, the course instructor will use her discretion to determine whether the exam can be made up.

Examinations are designed for you to synthesize the concepts addressed in class, lab, and the assigned readings and to apply that knowledge. To accomplish this goal, the exams will consist of a combination of short and long-answer questions that may include data analysis and application of concepts learned in class. Exams will be written, closed book/notes, and time-limited. You may work on written exams in the classroom only, unless instructed otherwise. The final examination is cumulative; the first three exams are not directly cumulative; *however*, understanding basic material covered in previous sections of the course is necessary to learn and demonstrate comprehension of the more advanced material covered as the course proceeds.

Quizzes: Weekly quizzes will be given in class every Wednesday. Collectively, the quizzes are worth 10% of your final grade (almost as many points as an exam), so take these assignments seriously! **The quizzes will cover the material from the day of the previous quiz through the Monday before the quiz.** You will not be allowed to use your book or notes. The purpose of these quizzes is to help you to learn the material for the course as we go along. Cell and Molecular Biology is not the type of course in which you can just study the night before the exam. Success in this course requires dedication and constant study. At the end of the semester your lowest quiz grade out of the 11 quizzes will be dropped. Because this policy will be strictly enforced, you should use this drop grade wisely.

Laboratory: The laboratory is an essential component in the life of a cell and molecular biologist, and the laboratory experience in this course will focus on learning the how the scientific method is used to address questions relevant to cell and molecular biology. You will work in pairs to complete two multi-week projects. Consult the laboratory manual for more detailed information about these projects. You will utilize the library to research the problems you will be investigating in the laboratory and develop relevant, testable hypotheses. Throughout the term, you will learn safe handling of common chemicals and techniques used in a modern cell and molecular biology research laboratory and will use these skills and techniques to collect and critically analyze data.

Your work in the laboratory will be assessed by: an accurate lab notebook that includes both pre-lab preparation and in-lab data collection; a scientifically formatted research paper; lab assignments focused on scientific writing, experimental design, and data analysis; and your ability to work safely, efficiently, carefully, and respectfully. Each of these aspects of the lab experience is described in more detail below.

a) **Lab Notebooks:** The lab notebook is to be a complete and accurate record of every step of a project from preparation through completion, including the planning required for each

experiment and a record of daily work. Although you will work in the lab in pairs, each student is required to keep his/her own notebook. With respect to pre-lab preparation, all good scientists carefully plan what they are going to do before they do it. To make this good habit one of your own, **we are requiring that you prepare "pre-labs" – outlines of the procedure that you plan to perform in the laboratory**. First, complete and prepare the assigned readings as well as any additional, relevant information in the lab manual and/or textbook before each laboratory session. Then, outline the experimental procedure and any information crucial to the experiment on the left half of your notebook. The pre-lab will be checked by the TA at the start of each lab period and you will earn 0-3 pts for each pre-lab. **For additional guidance on how to complete a pre-lab write-up, please refer to the BI 125 Moodle site.** It is important to realize that working in the lab unprepared can create a safety hazard for everyone. In addition to providing a safe lab environment, being well-prepared also permits you to more easily predict and confirm your results and troubleshoot your problems. In the laboratory, notebook entries should be completed daily with headings, hypotheses, protocols, observations, results, and a summary. The notebook should also include a table of contents and all final conclusions on the project. Each page should be numbered and dated and all entries made clearly and legibly. The notebook should be kept in a manner that someone unfamiliar with the project could pick up your notebook and interpret the project plan, protocols, and results, and be able to pick up with the work at any point. To keep an accurate notebook, record your observations and data as you collect them. Notebooks do not need to be works of art, but they do need to be complete, accurate, and legible. Carbon copies of your notebook entries will be collected and checked by your TA after each lab period and evaluated for completeness and legibility, and you will be given suggestions for improvement, if needed.

b) **Scientific Research Papers:** Scientists must learn to be good communicators in order to share their findings with the scientific community in the form of oral or written presentations. Written presentations are almost always reviewed by experts in the field prior to publication. To help you learn this skill of scientific presentation, we are requiring that each student present the cholinesterase project in the form of a scientific research paper, the final version of which is worth 150 pts. To facilitate the writing process, you are required to submit drafts of portions of this lab report. You are also encouraged to consult with the Writing Center prior to submitting these drafts and your final paper. All drafts (rough and final) must be submitted electronically via the appropriate TurnItIn.com assignment link integrated within the course Moodle site. Papers will not be accepted unless submitted via TurnItIn. This learning tool will help you learn about academic integrity and better understand plagiarism. To learn what plagiarism is and how to avoid it, you should also consult the resources on the BI 125 Moodle site, including plagiarism.org. Although lab partners should pool and discuss their data, each individual must write his/her own report. The Writing Center, located in the Humanities Center 102, offers one-on-one consultation with student writers in any BSC course. For an appointment, email Professor Lucas Johnson at ljjohnso@bsc.edu, or you can stop by HC 102 for a walk-in conference. Visit the Writing Center website at http://www.bsc.edu/academics/arc/writing.cfm for more information.

c) **Laboratory Assignments (Scientific Writing, Experimental Design, and Data Analysis):** Throughout the term you will be required to complete a variety of assignments focused on scientific writing, experimental design, and data analysis. Two exercises will introduce you to scientific resources in the library, and three workshops will guide you through careful analysis of the components of a scientific paper. Use of the scientific method will be reinforced in two assignments requiring you to design carefully-planned, controlled experiments. Additionally, four assignments will require you to analyze and interpret data collected from a variety of experiments.

d) **Laboratory Conduct/Safety/Participation:** While learning the tools of experimental cell and molecular biology is the major goal, those lessons are second to laboratory safety and responsible conduct. Work carefully and thoughtfully in the lab, and leave all work areas in the lab clean every day. Give special attention to equipment and areas of common use. You will earn 0-2 pts for each lab period for your active participation and safe conduct. If a safety hazard is created by irresponsible behavior to which no one fesses up, i.e. an unmarked container, unclean lab, then every student in the class will lose points on their laboratory conduct/safety grade. Have fun, but please be a responsible experimentalist!

Participation & Attitude (P&A): Attendance in laboratory is mandatory… no ifs, ands, or buts! Attendance at the lecture portion of the course is strongly encouraged, because it will help you focus your efforts to study the material presented in the text. If for any reason, you miss an exam or quiz, you must notify your instructor ASAP! I will decide on a case-by-case basis whether or not you will be allowed to make-up the exam/quiz. Furthermore, participation, attitude, and punctuality both in lecture and lab will be taken into account when calculating your final grade. Numerous pedagogical studies show that students learn best when they actively participate. Keep in mind that everyone brings a unique background to the course, and you have the opportunity to learn from these diverse backgrounds. The more involved you are in this course, the more you and your classmates will benefit. To encourage you to prepare for class and participate, I will assess your preparation and participation using clicker questions. Your participation grade for lecture will be derived from these clicker questions based on the following equation:

Participation (max 15 pts.) = Score for number of clickers answered + score for percent correct

Scores will be assigned as follows:

Number of clicker questions answered		Percent Correct	
90%-100%	10 pts.	75%-100%	5 pts.
80%-90%	9 pts.	50%-75%	4 pts.
70%-80%	8 pts.	25%-50%	3 pts.
60%-70%	7 pts.	10%-25%	2 pts.
50%-60%	6 pts.	<10%	1 pt.
40%-50%	5 pts.		
30%-40%	4 pts.		
20%-30%	3 pts.		
10%-20%	2 pts.		

<10% 1 pt.

Late Fees: 10% of the total possible points will be deducted for each day any written paper, assignment, etc. is late up to 50% of the total points. These days include Saturday and Sunday. All late work must be submitted in person, and it is your responsibility to find your instructor and place the late work in his/her hands. **An unexcused, undocumented class absence does not excuse work from late fees.**

Lecture Schedule (all dates are tentative):

Date	*Lecture Topic*	*Reading/Video*	*Quizzes*
Aug. 26	Intro, What is a cell?	Ch. 1: p. 2-20 Video: Cellular History	
Aug. 28	The Chemistry of Life: Bonding	Ch. 2: p. 36-49 Video: Atomic Structure	
Aug. 31	The Chemistry of Life: Bonding	Ch. 2: p. 36-49	
Sep. 2	**NO LECTURE—QUIZ ONLY**		Quiz 1
Sep. 4	The Chemistry of Life: The role of H_2O	Ch. 3: p. 54-64 Video: The Water Lattice	
Sep. 7	**LABOR DAY—NO CLASS**		
Sep. 9	Organic Molecules and Functional Groups	Ch. 4: p. 68-76 Video: Intro to Organic Molecules	NO QUIZ
Sep. 11	Macromolecules: Carbohydrates	Ch. 5: p. 80-86 Video: Macromolecules	
Sep. 14	Macromolecules: Lipids and Nucleic Acids	Ch. 5: p. 86-89, 98-102	
Sep. 16	Macromolecules: Proteins	Ch. 5: p. 89-98	Quiz 2
Sep. 18	Transfer of Energy in Biological Systems	Ch. 6: p. 108-117 Video: Types of Energy	
Sep. 21	Enzymes and Biochemical Rxns	Ch. 6: p. 118-126	End of material for Exam 1
Sep. 23	DNA: Experimental basis for heredity	Ch. 7: p. 131-139 Video: DNA Structure	Quiz 3
Sep. 25	**EXAM 1**		
Sep. 28	DNA Replication	Ch. 7: p. 139-148	
Sep. 30	DNA Replication	Ch. 7: p. 139-148	Quiz 4
Oct. 2	Transcription	Ch. 8: p. 153-162 Video: RNA and protein Structure	
Oct. 5	Translation	Ch. 8: p. 162-177	
Oct. 7	Translation	Ch. 8: p. 165-177	Quiz 5
Oct. 8-11	**FALL BREAK—NO CLASS**		
Oct. 12	Control of Gene Expression in Prokaryotes	Ch. 9: p. 181-186 Video: Gene expression	
Oct. 14	Control of Gene Expression in Eukaryotes	Ch. 9: p. 186-207	Quiz 6
Oct. 16	Cell Cycle and Mitosis	Ch. 10: p. 214-229 Video: Cell cycle	
Oct. 19	Meiosis	Ch. 11: p. 234-245 Video: Mitosis versus meiosis	

Oct. 21	Molecular Evolution	Ch. 13: p. 278-293 Ch. 12: p. 258-271 Video: Intro to Evo	End of Material for Exam 2; Quiz 7
Oct. 23	DNA Technology	Ch. 14: p. 298-306 Video: Uses of DNA Technology	
Oct. 26	**EXAM 2**		
Oct. 28	DNA Technology	Ch. 14: p. 307-325	Quiz 8
Oct. 30	Membranes and Transport	Ch. 15: p. 331-345 Video: Membrane Structure	
Nov. 2	Membranes and Transport	Ch. 15: p. 331-345	
Nov. 4	Membranes and Transport	Ch. 15: p. 331-345	Quiz 9
Nov. 6	Cell Signaling	Ch. 16: p. 350-369 Video: Intro to signaling	
Nov. 9	Cell Signaling	Ch. 17: p. 373-386	
Nov. 11	Cellular Respiration	Ch. 18: p. 391-397 Video: Overview of Respiration	Quiz 10
Nov. 13	Cellular Respiration	Ch. 18: p. 397-410	
Nov. 16	Photosynthesis	Ch. 19: p. 415-427 Video: Overview of Photosynthesis	
Nov. 18	Photosynthesis	Ch. 19: p. 428-433	End of Material for Exam 3; Quiz 11
Nov. 20	**EXAM 3**		
Nov. 23	The Cytoskeleton and Muscle Contraction	Ch. 1: p. 20-30 Video: Parts of the Cytoskeleton	
Nov. 25-29	**THANKSGIVING BREAK—NO CLASS**		
Nov. 30	The Cytoskeleton and Muscle Contraction	Ch. 20: p. 457-463	
Dec. 9	**FINAL EXAM 1:00 pm-4:00 pm**		

Laboratory Schedule, Fall 2015

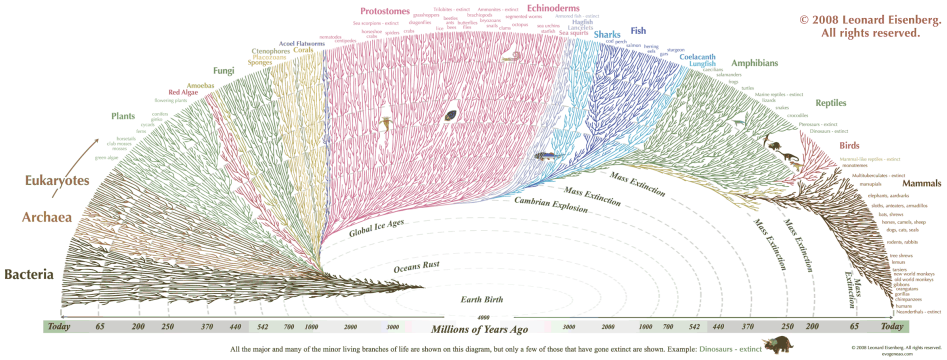
*Due dates/times: Assignments are due at beginning of lab unless indicated otherwise.

Lab	*Week of*	*Topic*	*Required Reading*	*Due**
I	1-3 Sep	Introduction to the Laboratory and Scientific Literature Use of Micropipettes	Appendices B-D	• Pre-Lab Write-Up • Library Exercise I due at end of lab
II	8-10	Horse Serum Cholinesterase: MW Determination	Symbiosis p. 307 (for DNA, not protein, but similar) Manual. pp. 1-19	• Pre-Lab Write-Up • Solutions & Dilutions Problem Set
III	15-17	Paper-Writing Workshop I: How to Make Figures Horse Serum Cholinesterase: Introduction to Ellman's Esterase Assay	Symbiosis pp. 118-121 Manual pp. 20-27 Appendix A, C, D, F	• Pre-Lab Write-Up • MW Graph
IV	22-24	Horse Serum Cholinesterase: Experimental Design	Symbiosis pp. 121-122 Manual pp. 28-29	• Draft of Figure/Legend Results/Methods for MW Determination (5PM Fri 2 Oct)*
V	29-1 Oct	Paper-Writing Workshop II: How to Write an Introduction Horse Serum Cholinesterase: Student Experiment 1 - Environmental Variables	Manual pp. 28-29 Appendix A, B	• Pre-Lab Write-Up • Library Exercise II
VI	13-15	Horse Serum Cholinesterase: Molecular Modeling	Symbiosis pp. 89-97 Manual pp. 30-43	• Molecular Modeling Pre-Lab Activity • Introduction Draft and Literature Cited (5PM Monday 19 Oct)*
VII	20-22	Horse Serum Cholinesterase: Substrate Concentration	Manual pp. 44-51 Appendix D, F	• Pre-Lab Write-Up • Molecular Modeling Worksheet
VIII	27-29	Horse Serum Cholinesterase: Data Analysis & Experimental Design	Manual p. 52	• V vs. S Graph • Draft of Results for Student Experiment 1 (5PM Mon 9 Nov)*
IX	3-5 Nov	Paper-Writing Workshop III: How to Write a Discussion Enzyme Kinetics: Student Experiment 2	Manual pp. 53-66 Appendix A	• Pre-Lab Write-Up
X	10-12	DNA Technology: Extraction & Restriction Digestion of Plasmid DNA, Polymerase Chain Reaction	Symbiosis pp. 298-305, pp. 305-308 Manual pp. 67-76 Appendix E, G	• Pre-Lab Write-Up
XI	17-19	DNA Technology: Analysis of Restriction Digestion, Polymerase Chain Reaction and Transformation	Symbiosis pp. 298-308 Manual 77-83 Appendix E, G	• Pre-Lab Write-Up • DNA Datasheet due in class Mon 30 Nov* • Cholinesterase Paper (5PM Tue 1 Dec)*

Dr. Pete Van Zandt
pvanzand@bsc.edu
226-7817

office hours (SSC 228):
Mon 2-4, Thur 9-11,
and by appointment

BI 225: Evolutionary Ecology



COURSE OVERVIEW

Members of all species (including humans) interact with other species and with their environment, and the traits they have are shaped by these interactions. Fundamentally, then, we all experience ecology every day, and who we are as an individual and as a species is influenced by evolution. Throughout this course, I hope that gain a greater appreciation of these ecological and evolutionary interactions in the natural and human -influenced world.

The course is built around **four modules**. **First**, we will cover the essential properties of biological evolution, then explore the variations of this process in depth. In the **second** module, our focus will shift to ecological interactions but the context will involve the ways that these interactions shape the traits of species. In our **third** module, we will explicitly return to evolutionary processes, but now on larger scales – how speciation occurs, and how behavior and reproduction influences evolution. We will also cover the ways that humans have evolved and how human evolution is related to the study of medicine. In our **final** module, we will treat ecological concepts from large-scale and more practical perspectives.

EXPECTATIONS

for you: To achieve the goals described above, each student is expected to…

- abide by the Birmingham-Southern College Honor Code (see p. 3) and all other college policies
- read in advance, prepare for, and actively participate in class activities
- be an active participant in your education – ask lots of questions
- be respectful and polite when engaging in online and in-class discussions
- **refrain from using a cell phone** or computer for anything besides EvoEco material during class times (including during exams)

from me: My interest is in helping you get the most out of your education, so I…

- have carefully designed this course to be engaging and to help you learn.
- will be accessible throughout the semester
- will be respectful of your questions and mindful of your perspectives as a learner.
- will make every effort to return graded work in a timely fashion with meaningful feedback.

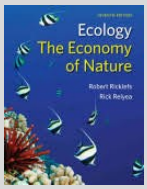
"I can explain it to you, but I can't understand it for you"
Robert Gammage, Texas state senator

Fall 2015

Section A: MWF 9:30 – 10:30
Section B: MWF 12:30 – 1:30

CONTENTS

REQUIRED MATERIALS



- Ricklefs, R. E. and R. Relyea 2014. Ecology: The Economy of Nature (7th ed.), ISBN-13: 978-1-4292-4995-9, ~$156 new, much less online
- SimUText software (instructions for purchase on Moodle page ~ $43 per student)
- TurningPoint clicker (bookstore or online)

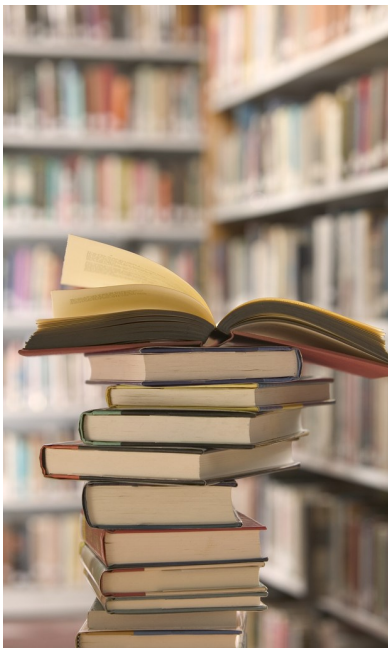
PLAN AHEAD

This class will challenge your organizational skills. It will be your responsibility to keep track of all the assignments, videos, and activities that are due in the class. Pay special attention to these assignments as there may be substantial late penalties for missing them. Consult this syllabus and the Moodle page regularly.

TURNING THINGS IN

Unless specified otherwise, all assignments (including summary papers) need to be submitted through Moodle.

HOW I APPROACH THIS CLASS



This course is designed to be **more student-oriented** than a typical lecture course. According to many studies, students learn best when they are actively working on a task rather than passively listening. Both passive listening and active work can make useful contributions to your learning, but active work takes more effort than passive listening.

My goal is to spend several sections of in-class time identifying misunderstandings and misconceptions, improving the depth of your understanding, and actively working on the material. Therefore, while some of the class meetings will be traditional lectures, others will require you to watch (and take notes on) pre-recorded videos and that are available on YouTube.

During class, we will not cover everything you need to know for the course, so you will need to **take an active role in your learning**, which means watching videos, doing exercises, and reading the required material BEFORE coming to class. **The solidifying activities don't work if there's nothing to solidify**, so if you're not prepared to come to class your comprehension will likely suffer as a consequence. Overall, significant emphasis will be placed on student accountability, and the success of the course will largely depend on the involvement and commitment of you, the student.

Why a focus on critical thinking and writing?
*Nearly all employers surveyed **(93 percent)** say that "a demonstrated capacity to **think critically, communicate clearly, and solve complex problems** is **more important** than [a candidate's] undergraduate major."*
(source: AAC&U survey, 2013)

COURSE VIDEOS

Pre-class video lectures free up time for in-class activities, but **they don't work if you don't actively watch them before class**. They have several advantages over lectures:

- You can watch them at your convenience and at your own pace
- You can stop watching when you feel tired or replay portions that you didn't understand the first time
- You can pause them to take notes (or go to the bathroom, get a snack, answer the phone…)
- You can watch them again before exams to review material or see it in a new context now that you've learned more in the class

See the **introductory video** on how to watch videos for class on the course Moodle page.

COURSE GOALS

While the subject matter of this course is Evolutionary Ecology, BI 225 is about much more than that. As you are learning content, you will also be honing your skills as a writer, an editor, a critical thinker, a reader of scientific literature, and designer of experiments. In short, **the fundamental goal of this class is for you to continue your development as a scientist**. These skills will be beneficial to you no matter what field you go into in the future. Specifically, upon successful completion of this course, a conscientious student should be able to…

Content-based goals

- Demonstrate an understanding of the process of biological evolution.
- List the essential steps required for biological evolution to occur and provide examples.
- Understand the ways that organisms interact with each other and their environment.
- Apply your knowledge of ecological and evolutionary principles to novel situations, examples, and simulations.

Skills-based goals

- Think, argue, and reason critically while analyzing scientific literature.
- Write clearly and critique scientific writing as both an author and peer editor.
- Interpret figures and data and relate these results to hypotheses & predictions of a study.
- Evaluate primary literature in Moodle discussion boards and in class.
- Critique the ways scientists gather data and design experiments to test hypotheses.

Planning on becoming an evolutionary ecologist? (Probably not)
Even so, there is value to learning evolutionary ecology. Evolution is happening to all species (and even viruses). Besides, this class helps you develop your skills as a scientist, and you can't apply your scientific skills if you don't know the content.

THE BSC HONOR CODE:

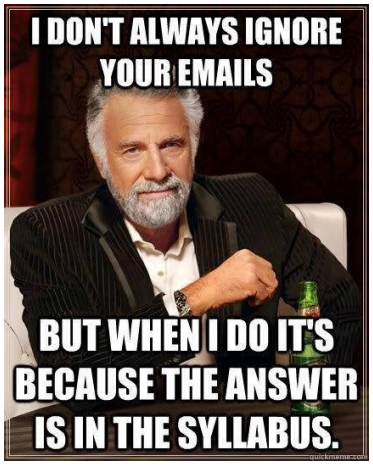
All students in this course are expected to maintain academic integrity and uphold the Honor Code at all times. Specifically in this course, the following are considered violations of the Honor Code: collaborating on work assigned for individual completion; consulting or possessing work (except exams) of those who have previously completed this course; overstating your level of participation in a group assignment; using unauthorized resources in the completion of exams, quizzes, and assignments; plagiarism; turning in work that is not your own; lying, stealing, and lack of adherence to the instructions on any examination, quiz, assignment, or course policies listed in this syllabus. Any violation of the honor code will be reported to the Honor Council and will result in a zero on that assignment. Penalties imposed by the Honor Council may be in addition to this academic penalty, and often include academic probation, suspension, or expulsion.

COURSE POLICIES

Attendance & Participation: Successful attainment of the goals of this course requires active participation. Therefore, attendance in the classroom is a good idea. Students will be called on at random to answer questions from the readings or other course materials. You are expected to be on time and to stay for the duration of the class meetings. If you know you will be missing class due to a documented and scheduled event (athletic or academic), you should notify me in advance to make accommodations. It is your responsibility to make up any missed material.

Academic Adjustments: BSC is committed to providing appropriate accommodations to meet the learning needs of students. It is your responsibility to communicate your needs with me. If you have questions about academic accommodations, please contact the Counseling and Health Services office at 205-226-4717 or you may email Jason Peevy, at jpeevy@bsc.edu.

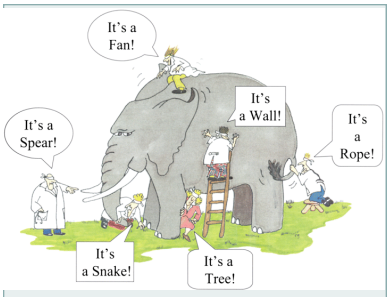
Communication: I will check and respond to student email within 48 business hours. I will send you lots of information via email, so read your BSC email.



Cancellations & Time/Location Changes: If class is cancelled or if there is a change in time or location of class for any reason, an email announcement will be sent and posted on Moodle and a sign posted on the classroom door as soon as possible. In the event that class is cancelled, you will be expected to complete the scheduled reading. You will also be expected to complete assignments due for the cancelled class.

Late assignment policy: Late assignments will still receive credit, so it's always a good idea to turn something in even if it's late. Unless otherwise specified for a particular assignment, late assignments will lose 5% per day (maximum penalty = 50%).

Don't be afraid of questions
"Everyone is an idiot, not just the people with low SAT scores. The only differences among us is that we're idiots about different things at different times. No matter how smart you are, you spend much of your day being an idiot." *Scott Adams, cartoonist*



THE VALUE OF FLIPPED LEARNING

While the structure of this course gives you more control over your learning, it also requires responsibility on your part. However, you are not expected to teach yourself the material in this course. Instead, the rationale for the course is that you will be receiving **more guidance, material, and assistance from me in this format** that you would in a traditional format.

This approach is sometimes referred to as a flipped (or inverted) classroom, because we are flipping the traditional roles of in-class and out-of-class work. It can also be described as a form of blended learning, because digital content (videos, simulations, etc.) are blended together with traditional lectures in class.

There is a large body of research that shows that this approach helps you not only to learn the material better but also to learn **how to learn** (which is what a liberal arts education is supposed to be about, right?).

EXAMS

There are 2 exams during the semester and 1 cumulative final.

Exams include a combination of multiple choice, short answer, and essay questions relating to all course goals and content.

The focus will be on **critical thinking** rather than just memorization. That is, you must understand the concepts in order to apply them to new situations.

If you know in advance that you'll be absent during an exam for an excused reason, I will arrange for an alternate test that will be entirely essay based.

If an exam is missed due to an excusable absence, then the average score from the other exams will be substituted (this does not apply to missing the final exam).

QUIZZES

There will be quizzes for most class meetings to encourage you to be on time to class, do the readings, watch the videos, and come prepared for class.

Missed quizzes cannot be made up, but you will drop your lowest two quiz grades.

If a quiz is missed due to extenuating circumstances (e.g., *documented and Provost office-approved* medical or family emergency, athletic event) the average score from the other quizzes will be used as the grade for the missing quiz.

ASSIGNMENTS & GRADING

Letter grades, as defined by the current BSC Catalog, will be assigned at the end of the course based on the number of points that you earn where 93-100% = A, 90-92% = A-, 87-89% = B+, 83-86% = B, 80-82% = B-, 77-79% = C+, 73-76% = C, 70-72% = C-, 67-69% = D+, 60-66% = D, and <60% = F.

Grade category	% of total grade
In-class Exams	20%
Final Exam	15%
Quizzes	9%
Paper Discussions	
Moodle Forum	6%
Participation	6%
Article summary	10%
Peer review	2%
Peer grade for 1st drafts	2%
EvoBeakers and online activities	25%
Additional Assignments /Participation	5%

DOING WELL IN THIS COURSE

READING AND VIDEO GUIDES

The readings and videos for this course have been chosen to help you understand the material and are complimentary with class topics. **Many studies have shown that comprehension increases substantially when students are actively engaged in their education and utilize many approaches to learn the material.** Therefore, reading guides are provided for each of the class readings and many videos. You will learn best if you complete these guides before we cover the material for that class period.

SIMUTEXT & ONLINE ACTIVITIES

There are several online exercises that require the use of SimUText or other software. **Instructions for accessing the software are available on the Moodle page**. These assignments require you to keep track of answers from computer simulations. Your answers will be graded for accuracy and completeness. You may consult with classmates while working on these assignments, but **each student is required to do their own work, write answers in their own words, and submit their own workbook**. There will be additional homework problems and other activities assigned in class as opportunities arise.

STUDY SKILLS

The college rule of thumb is that for each class, students should **spend approximately 2-3 of study time for each hour that they spend in class** (obviously, this must be focused, active studying not watching TV while your book is open).

Don't just rely on logging a lot of hours studying, though. You may want to train your study skills by reading up on some active learning techniques (Google "study less study smart").

I also encourage you to visit the Study Skills web site from BSC's Counseling and Health Services (search for "study skills" on the BSC home page). Another good resource at BSC is the Academic Resource Center, or ARC (http://www.bsc.edu/academics/arc/index.cfm), which provides you help with paper writing, study skills, and can even put you in touch with a peer tutor for your classes.

PAPER DISCUSSIONS

There will be 6 scientific journal articles assigned throughout the semester. These journal articles are posted on the Moodle page and are central to the course. For the paper discussions, your obligations are to:

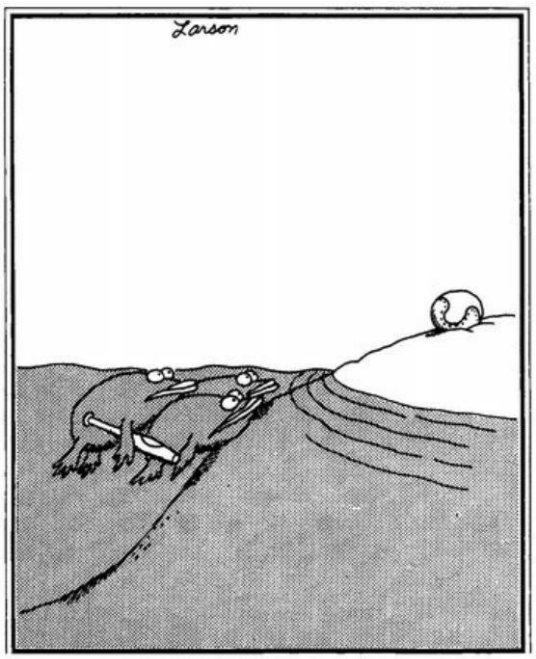
1. READ THE PAPER. All students are responsible for reading EACH assigned paper.

2. POST ON FORUM (on the Moodle page). For each paper, you will post on the Moodle Forum either a novel question pertaining to the paper or a thoughtful answer to someone else's question. You will be graded on the quality of the question or answer, and trivial or unoriginal posts will earn 0 points (you can't just rephrase someone else's question or write, "Yeah, I agree with John"). These posts will have a strong influence on the direction of the discussion, so you must also read each of the postings listed for each paper the morning before class. **Postings must be made before midnight the night before the class discussion. Late postings between midnight and 8am can still receive up to 5 points, but postings made after 8am will receive 0 points**.

- **Hint**: reading the paper early and posting a thoughtful question before anyone else does is a good way to avoid being scooped.

3. PARTICIPATE IN THE DISCUSSION. The success of the discussions will rely heavily on participation from the WHOLE class! You will be graded on your level and quality of participation. Showing up will be necessary to earn any points, but speaking up during the discussion is the only way to earn full points. The more thought-provoking your comments, the higher your participation grade will be (again, saying "Yeah, I agree with John" is not adequate).

Hint: bringing up something from the discussion board when it seems appropriate is an easy way to contribute to the discussion.



Great moments in evolution

PAPER SUMMARIES

One of the most important activities of the semester is the paper summary. This is an assignment where the **AUTHOR** summarizes a scientific paper in a format that a non-scientist could understand. We'll go over examples of how to do this during our first two paper discussions.

These **SUMMARIES** are reviewed by peers in class (**EDITORS**), who provide feedback on and grade your first drafts.

This process is double-blind, in that authors don't know their editors and editors don't know their authors.

This is a complicated process that relies on timeliness from both authors and editors. For instructions, see the following files on Moodle:

1) **Summary paper guidelines**
2) **Instructions for authors and editors**
3) **Paper grading rubric**
4) **Rubric for grading editor**

Turnitin (through Moodle): You will be turning in drafts, final summaries, and other assignments through Moodle, and they will be checked for plagiarism by turnitin.com. The service at turnitin.com includes tools to educate students about what plagiarism is and how to avoid it by citing sources correctly. **Plagiarism is a serious offense and blatant cases will be sent to the honor council; therefore, I strongly encourage you to check out the following web site for ways to avoid plagiarism**: http://www.plagiarism.org. Talk with me if you have any problems, questions, or concerns.

"If you can't explain it simply, you don't understand it well enough"
Albert Einstein

Class Schedule (subject to change)

all deadlines are by the start of class unless noted otherwise

Date	Day	Topic	Readings/Assignments **EoN** = our course text book. **See reading guides** for page numbers.	Important deadlines & notes
Module 1: Fundamentals of Evolution				
8/26	W	Course introduction	Syllabus Videos on Moodle	Quiz on syllabus and introduction videos
8/28	F	Terminology and scientific method	EoN Ch. 1	Quiz on chapter 1 (see reading guide on Moodle)
8/31	M	Population Genetics / Hardy-Weinberg equilibrium	EoN Ch. 7a Videos on Moodle	
9/2	W	Exceptions to Hardy-Weinberg equilibrium	EoN Ch. 7b Videos on Moodle	Know your three articles!!! (come prepared with authors' names) Hypothesis testing assignment due (see Moodle) In-class activity
9/4	F	**Paper 1 Discussion: How to Read a Scientific Paper**	**Paper 1: Gonzálvez et al. 2013 – ants deter bees**	Discussion board posts due @ midnight before class HWE problem set due (assigned in class)
9/7	M	**Labor day—no classes**		
9/9	W	*Sickle-Cell Alleles* Simutext *(in class)*	pp. 1-6 of Sickle-Cell Alleles workbook Sickle-Cell video (see Moodle)	Meet in SSC 240 Are these pop'ns in HWE? assignment due
9/11	F	Discussion of "Judgment Day"	Watch "Judgment Day" (see link and guide on Moodle)	"Judgment Day" assignment due SimUText *Sickle-cell Alleles* due
9/14	M	Genetic variation and Evolution by natural selection	EoN Ch. 7c Videos on Moodle	SimUText *Evolution for Ecology* due (do on your own)
9/16	W	**Paper 2 Discussion: How to Summarize a Scientific Paper**	**Paper 2: Rundus et al. 2007 – infrared squirrels** **Blumstein 2007 – comment**	Discussion board posts due @ midnight before class
9/18	F	Modes of Selection	EoN Ch. 7d Videos on Moodle	
9/21	M	Critical thinking exercise		In-class activity
9/23	W	Misconceptions about Evolution and Natural Selection	Misconceptions videos (see Moodle)	In-class activity
9/25	F	**Exam 1**		See practice exams on Moodle

Module 2: Ecological Interactions				
9/28	M	Population Dynamics	EoN Ch. 11, 12 Videos on Moodle	SimUText *Understanding Population Growth Models* due (do on your own) In-class activity
9/30	W	Agents of Selection: Competition I	EoN Ch. 16 Videos on Moodle	**Authors**: Paper 3 summary draft due to Moodle by start of class
10/2	F	Agents of Selection: Competition II	EoN Ch. 16 Videos on Moodle	SimUText *Niche Wars* due (do on your own) In-class activity
10/5	M	Agents of Selection: Predation I	EoN Ch. 14 Videos on Moodle	**Editors**: Reviews of Paper 3 summaries due to Moodle by start of class
10/7	W	**Paper 3 Discussion**	**Paper 3: Becker & Leiss 2015 – interactions affect adaptation**	Teleology assignment due Discussion board posts due @ midnight before class **Authors**: Final summary for Article 3 due on Moodle by start of class
10/9	F	**Fall break – no class**		
10/12	M	Agents of Selection: Predation II	EoN Ch. 14 Videos on Moodle	SimUText *Darwinian Snails* due (do on your own) In-class activity
10/14	W	Agents of Selection: Mutualism and Parasitism	EoN Ch. 15, 17	**Authors**: Paper 4 summary draft due to Moodle by start of class
10/16	F	Agents of Selection: Herbivory	EoN Ch. 14	
10/19	M	Field activity on diversity of interactions	Videos on Moodle	**Editors**: Reviews of Paper 4 summaries due to Moodle by start of class In-class activity
10/21	W	**Paper 4 Discussion**	**Paper 4: Kohl et al. 2014 – attractive cactus spines**	Interactions assignment due (see Moodle) Discussion board posts due @ midnight before class **Authors**: Final summary for Paper 4 due to Moodle by start of class
10/23	F	Critical thinking exercise		In-class activity
10/26	M	**EXAM 2**		

Module 3: Macroevolution and Alternatives to Natural Selection				
10/28	W	Speciation	EoN Ch. 7e Videos on Moodle	Speciation computer exercise due In-class activity
10/30	F	Cladogenesis and phylogeny	Readings on Moodle Videos on Moodle	SimUText *Flowers and Trees* due (do on your own)
11/2	M	Cladogenesis and phylogeny		In-class activity **Authors**: Paper 5 summary draft due to Moodle by start of class
11/4	W	Human Evolution		In-class activity
11/6	F	Sexual Selection	EoN Ch. 9	**Editors**: Reviews of Paper 5 summaries due to Moodle by start of class
11/9	M	**Paper 5 Discussion**	**Paper 5: Byrne & Nichols 1999 – London subway mosquitoes**	Discussion board posts due @ midnight before class **Authors**: Final summary for Paper 5 due to Moodle by start of class
11/11	W	Evolution and medicine	Videos on Moodle Online readings (see Moodle for links)	**Authors**: Paper 6 summary draft due to Moodle by start of class
11/13	F	Kin and Group selection	EoN Ch. 10 Videos on Moodle	In-class activity
Module 4: Ecology at Larger Scales				
11/16	M	Food webs and trophic cascades	EoN Ch. 18 Videos on Moodle	Kin selection assignment due In-class activity **Editors**: Reviews of Paper 6 summaries due to Moodle by start of class
11/18	W	**Paper 6 Discussion**	**Paper 6: Farkas et al. 2013 – camo evolution & cascades**	Discussion board posts due @ midnight before class **Authors**: Final summary for Paper 6 due to Moodle by start of class
11/20	F	Island Biogeography and Species-area relationships	EoN Ch. 22 Videos on Moodle	SimUText *Biogeography* due (do on your own) In-class activity
11/23	M	Conservation Biology	EoN Ch. 23 Videos on Moodle	Biodiversity assignment due In-class activity
11/25-11/27	W-F	**Thanksgiving break – no classes**		
11/30	M	Critical thinking exercise		In-class activity
		FINAL EXAM	Section A: Thursday, December 10 1:00-4:00 pm	Section B: Wednesday, December 9 1:00-4:00 pm

CH/BI 308 – Biochemistry

Birmingham –Southern College

Fall 2015

1 COURSE DESCRIPTION AND OBJECTIVES

CH308/BI308 is a one semester introductory to biochemistry course for biology and chemistry majors. This course aims to provide an overview of a variety of biochemical principles such as metabolism, enzyme kinetics, biosynthesis of macromolecules, structure and function of macromolecules, and energetics; as well as prepare students to think critically and apply these topics to modern day problems. This course also aims to explore the physiological pathways with in the cell and how they become dysfunctional in disease states. After completion of this course students should be able to:

- Apply knowledge of biological systems and their interactions to explain how the human body functions in health and disease,
- Apply knowledge of the atomic and molecular characteristics of biological molecules to predict normal and pathological molecular function,
- Explain how the regulation of major metabolic pathways function to maintain health and identify major forms of dysregulation in disease,
- Apply major principles of physics and chemistry to explain normal biology, pathology and significant diseases,
- Explain the mechanism of action of major technologies used in the prevention, diagnosis and treatment of disease.

COURSE INFORMATION

Meeting: Blended Learning Classroom, Library Room LSR, MWF 11:00 a.m. – 12:00 p.m.

Instructor: Kate Hayden, SSC 342

Email: khayden@bsc.edu

Phone: 205-223-4872

Office Hours: T: 1:00-3:30pm W: 2:00-3:30pm F: 1:30-3:30pm

Facebook Hours: T/Th: 8:00–10:00pm

Teaching Asst: Sean McCarthy

Email: sjmccart@bsc.edu

Required Materials:

Fundamentals of Biochemistry 4th ed. By Donald Voet, Judith Voet, and Charlotte Pratt.

Foundations of Biochemistry 3rd ed. By Jenny Loertscher and Vicky Minderhout

2 COURSE WORK AND EVALUATION

Letter grades, as defined in the BSC Catalog, will be assigned at the end of the course based on the number of possible points that you can earn, where 93-100% = A, 90-92% = A-, 87-89% = B+, 83-86% = B, 80-82% = B-, 77-79% = C+, 73-76% = C, 70-72% = C-, 67-69% = D+, 60-66% = D, and <60% = F.

Item	Possible Points
Exam I	100
Exam II	100
Exam III	100
Cumulative Final Exam	200
Literature Review Paper	200
Lecture Quizzes	100
In Class Assignments	200
Total Possible	**1000**

3 PRE-CLASS PREPARATION

Since this is a "flipped class", each student must prepare for class ahead of time by reading the assigned chapter from the text and watching the lecture videos. Lecture videos will be posted to the course Moodle page when available. **After reading and watching the video, students are encouraged to post comments, questions, or concerns about the material in the course page discussion board for that chapter**. These responses can even include comments, questions and concerns regarding the material. For classes involving POGIL activities, each activity has a pre-activity assignment that must be completed and turned in prior to the start of class Students are encouraged to read and respond to each other's posts in the string. Proper preparation before class will help ensure students' success in group activities, discussions and POGIL workshops during class

4 LITERATURE REVIEW PAPER

Throughout the semester students will write a literature review term paper concerning a disease, disorder, or illness and describe how it impacts the human body via disruption of various physiological pathways and discuss existing or possible treatment options. For instance, patients with cystic fibrosis suffer from a genetic mutation that causes the Na+/K+ protein pumps found in various tissues to be dysfunctional. As a result, patients suffer from poor digestion and absorption of dietary triglycerides (the salt pumps are linked to the release of lipases into the small intestines), high risk of bacterial infections in the lungs (improper pumping of salts causes mucus build up and abnormal pH levels on the lining of the lung in which bacteria thrive), and male patients are unable to reproduce (the malfunctioning salt pumps prevent the release of semen). As can be seen, one mutation in one protein can cause a myriad of disturbances through a variety of physiological processes which can greatly impact patients' quality of life. Student papers should be original and should tie in as much RELEVANT course material as possible. More detailed information on this term paper, as well as a detailed rubric will be given at a later date.

5 LECTURE QUIZZES

Throughout the term, various lecture videos will have quizzes embedded within the video. To initiate the quiz you must provide your bsc.edu email address and full name at the start of the video. Once you have finished the lecture, the program will compile and score your answers and sends me a report daily. To earn full credit for the quiz you MUST complete the lecture video prior to the start of class (each report is time stamped), quizzes not completed will be given a score of zero, NO MAKE UPS ARE ALLOWED FOR QUIZZES. You will have the option to drop your lowest quiz score at the end of the term.

6 IN-CLASS ACTIVITIES

During class, students will participate in various group activities and discussions to apply the material studied prior to meeting. Students will work together in teams of three to discuss and work through activities. The solutions or results from activities will be discussed at the end of class as a class and any necessary work will be collected for participation grading. Groups will be selected by the instructor at random and groups will be reassigned after every exam to increase learning diversity. To ensure full group participation, confidential peer-reviews of group work will be completed after every exam and submitted to the instructor.

7 EXAMINATIONS

Three in-class examinations and a cumulative final examination will be given. You are expected to take all exams on the dates and times scheduled. If an exam is missed due to extenuating circumstances, i.e., documented and Provost Office-approved medical or family emergency, the course instructor will use her discretion to determine whether the exam can be made up.

8 ATTENDANCE POLICY

Due to the nature of this course, attendance in class is mandatory and will be taken each day of class. More than three unexcused absences will result in an F for the course. Those who attend all classes will receive a 10 point bonus. Attendance will be taken daily at the start of class.

9 HONOR CODE

Each student is expected to follow the BSC Honor Code. If it is determined that you have violated the honor code during a pre-activity, in-class activity, homework assignment, quiz, or exam you will receive a zero on that component of your grade. Students may not look at POGIL activities from previous years.

10 PORTABLE DEVICES

Use of cell phones or other electronic devices to send or receive calls, text messages, surf the internet, etc. are not allowed in the classroom for personal use. Such devices can only be used to aid in group activities when suitable. However, these devices are NOT allowed for use during exams and should be turned off before the start of the exam so they will not ring, vibrate, or otherwise disturb you, your fellow students, or your instructor.

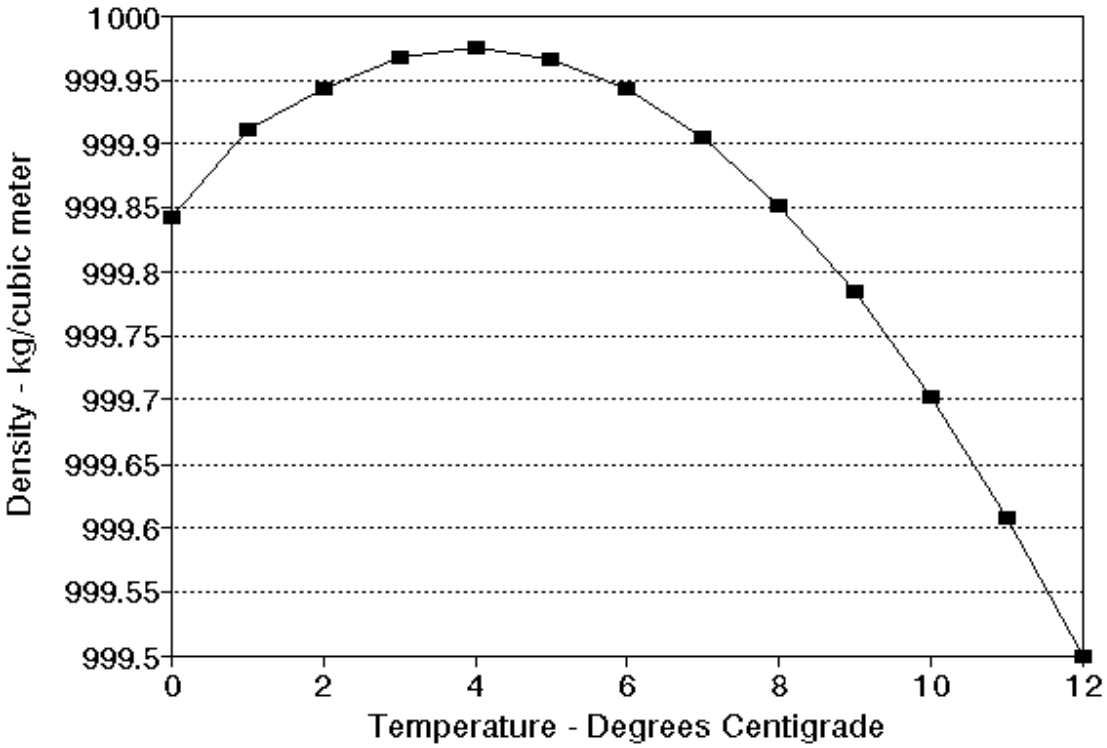
11 DISABILITY SUPPORT SERVICES

Under the directives and guidance of the Americans with Disabilities Act (ADA) and Rehabilitation Act of 1973, we are committed to providing appropriate accommodations to meet the learning needs of disabled students. If you believe that you qualify for learning accommodations based official documentation, please contact me and appropriate learning accommodations in accordance with the recommendations can be arranged. It is critical that you contact your instructor within the first week of the course so that appropriate arrangements can be made. If you believe that you have a learning disability, but do not yet possess substantial supporting documentation, please contact the BSC Counseling and Health Services by calling x4717.

Group Member	Contact Information

Lecture	Date	Topic	Ch.#	In-Class Activity
	8/26	Introduction		
1	8/28	Thermodynamics (**QUIZ**)	1	CAT Test
2	8/31	Water, Weak acids, Buffers	2	Work Sheet
3	9/02	Nucleic Acids	3	S18: Higher Order Structure of Nucleic Acids
4	9/04	Amino Acids (QUIZ)	4	S1: Amino Acids and the Primary Structure
	9/07	**Labor Day – No Class**		
6	9/09	Protein Structure	6	S2: 3-D Structure of Proteins
7	9/11	Protein Function – Hemoglobin (QUIZ)	7	S6: Hemoglobin – Structure and Function
8	9/14	Protein Function – Muscle Contraction	7	S5: Problem-Solving Challenge
9	9/16	Carbohydrates	8	S11: Carbohydrates and Glycoproteins
10	9/18	Lipids	9	S12: Lipid Structure and Function
11	9/21	Biochemical Techniques (QUIZ)	3,5	S3: Tools of Biochemistry
12	9/23	Biochemical Techniques	3, 5	S4: LWBGase
	9/25	**EXAM I (Lectures 1 through 12)**		
13	9/28	Enzyme Catalysis (QUIZ)	11	S7: Enzyme Catalysis
14	09/30	Enzyme Kinetics	12	S8: Enzyme Kinetics
15	10/02	Enzyme Inhibition (QUIZ)	12	S9: Enzyme Inhibition
16	10/05	Enzyme Control and Drug Design	12	S10: Enzyme Problems
17	10/07	Introduction to Metabolism I (QUIZ)	14	S19: Understanding the Rate Determining stp
	10/09	**FALL BREAK**		
18	10/12	Introduction to Metabolism II	14	S20: Understanding Metabolically Far From
19	10/14	Glycolysis	15	S22: Enzymes in Glycolysis
20	10/16	Glycolysis (QUIZ)	15	S23: Regulation of Glycolysis
21	10/19	Fermentation	15	S26: Glycolysis and Gluconeogenesis P.S.1
22	10/21	Pentose Phosphate Pathway	15	S28: Pentose Phosphate Pathway
23	10/23	Gluconeogenesis	16	S27: Glycolysis and Gluconeogenesis P.S.2
	10/26	Review Day/Mid-course Assessment		
	10/28	**EXAM II (Lectures 13 through 23)**		
24	10/30	The Citric Acid Cycle (QUIZ)	17	S29: Exploring Pyruvate Dehydrogenase and The Citric Acid Cycle
25	11/02	The Citric Acid Cycle	17	S30: Exploring the Citric Acid Cycle
26	11/04	Electron Transport (QUIZ)	18	S31: Electron Transport
27	11/06	Electron Transport	18	Case Study – The Effect of DNP on ETC
28	11/09	ATP Synthesis (QUIZ)	18	S32: Oxidative Phosphorylated
29	11/11	ATP Synthesis	18	Case Study/Reflection
30	11/13	Lipid Metabolism	20	S33: Fatty Acid Degradation and Glucose Synthesis
31	11/16	Lipid Metabolism	20	S34: Understanding Fatty Acid Biosynthesis
32	11/18	Amino Acid Metabolism	21	S38: The Urea Cycle and the Effects of Protein Degradation
33	11/20	Integrated Metabolism (Review)		S36: Integrated Metabolism
	11/23	**Exam III (Lectures 24-33)**		
	11/25	THANKSGIVING BREAK		
	11/27	THANKSGIVING BREAK		
	11/30	Post-course Assessment and/or catch up		
	12/10	**FINAL EXAM 9am**		

Density of Liquid Distilled Water



Adapted from http://w3.marietta.edu/~biol/biomes/water_physics.htm.

1. Describe the relationship between temperature and the density of water.

2. A student in your class hypothesizes that as the temperature approaches 4°C, individual water molecules become heavier, leading to an increase in density compared to higher or lower temperatures. How strongly does the data support this statement?
   _____ Very strongly
   _____ Moderately
   _____ Weakly
   _____ Not at all

3. Based on your knowledge of water structure, state an alternative hypothesis that explains the relationship shown in the graph.

4. What additional information could help to test or confirm your hypothesis?

Critical Thinking Exercises

For the scenarios below, please work together in your groups to answer the questions. You need only turn in one file for each group, but each group member's name should appear on the file.

Group members:

Scenario 1) A middle-aged, slightly overweight white male is admitted to the emergency room complaining of intense chest pain and shortness of breath.

1) List off 5 different possible explanations for the cause of this patient's symptoms.
    a.

    b.

    c.

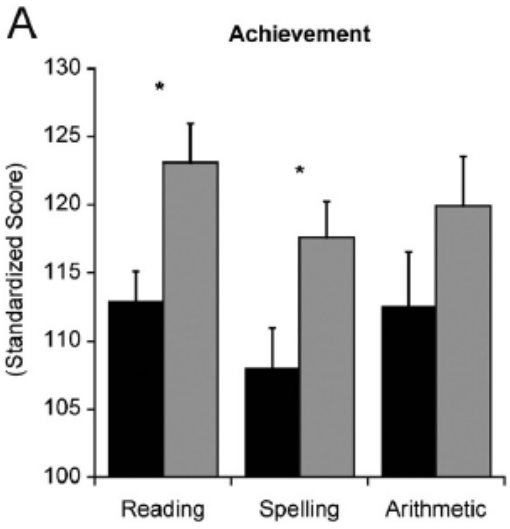
    d.

    e.

2) Choose two of these explanations that you think you should investigate and circle their letters above. Why did you choose those two over the others?

3) For each of the two explanations you chose above, describe the additional information (tests, observations, manipulations, etc.) that would help you determine whether or not this potential explanation is the true cause of the patient's pain. Please describe two sources of information per explanation as a bare minimum.

Scenario 2) Scudder et al. (2014) gave 46 preadolescent children fitness tests (by measuring their aerobic fitness following a 2 minute walk on a treadmill) and also gave them a standardized academic tests in reading, spelling, and arithmetic. The results are shown below, and the dark bars are students in the 25th (lowest) percentile for aerobic fitness, while the lighter bars are the students in the 75th (highest) percentile for aerobic fitness. Asterisks indicate statistically significant differences between groups of students.



1) What relationship or pattern is shown in figure A?

2) Scudder et al. concluded that exercise made children smarter. How strongly do the data support this statement?

_____ Very strongly
_____ Moderately
_____ Weakly
_____ Not at all

3) Develop at least three alternative explanations for why the pattern in figure A could be observed. Try to be as specific as possible in your explanations, but keep them brief.

4) Choose (and indicate) two of any of the possible explanations for the data, and list additional information that would help you determine which explanation was most likely to be correct.

BI/CH308 Biochem CAT Apps

19. Recently a research group from Spain published a 5 year study in JAMA Internal Medicine in which female participants who were randomly allocated to a Mediterranean diet supplemented with extra-virgin olive oil, a Mediterranean diet supplemented with mixed nuts, or a control diet (advice to reduce dietary fat), and published the following results:

	Mediterranean diet supplemented with extra-virgin olive oil	Mediterranean diet supplemented with mixed nuts	Control diet – advice to reduce dietary fat
Incidence of Breast Cancer after 5 years	1.1	1.8	2.9

The researchers concluded that women who eat a Mediterranean diet with olive oil can reduce their risk of breast cancer by as much as 68%.

a. How do you interpret the table above?

b. How strongly do you believe the data supports the researcher's hypothesis?

c. What are three pieces of additional information you would find helpful in assessing the study described above?

d. List two possible alternative explanations for the data above:

e. Describe an experiment you could conduct to test one your alternative explanations:

SALG - Student Assessment of their Learning Gains

Melanie Styers, ,

Instrument #71238, BI 125, Fall 2015

Administered Mon Aug 31, 2015 - Fri Sep 04, 2015

http://www.salgsite.org/

ID	Numl	Question	Type	Choices...	
826		**Understanding**	Category		
827	1	Presently, I understand...	Category		
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	1: not applicable	2: not at all
22435	1.2	How studying topics in this course help people address real world issues	Select one	1: not applicable	2: not at all
858		**Skills**	Category		
869	2	Presently, I can...	Category		
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	1: not applicable	2: not at all
865	2.2	Write documents in discipline-appropriate style and format	Select one	1: not applicable	2: not at all
866	2.3	Work effectively with others	Select one	1: not applicable	2: not at all
150037		**Critical Thinking Skills**	Category		
150038	3	Presently, I can...	Category		
150039	3.1	Separate factual information from inferences.	Select one	1: not applicable	2: not at all
150040	3.2	Interpret numerical relationships in graphs.	Select one	1: not applicable	2: not at all
150041	3.3	Understand the limitations of correlational data.	Select one	1: not applicable	2: not at all
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	1: not applicable	2: not at all
150043	3.5	Identify alternative interpretations for data or observations.	Select one	1: not applicable	2: not at all
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	1: not applicable	2: not at all
150045	3.7	Explain how new information can change a problem.	Select one	1: not applicable	2: not at all
150046	3.8	Separate relevant from irrelevant information.	Select one	1: not applicable	2: not at all
150047	3.9	Integrate information to solve problems.	Select one	1: not applicable	2: not at all
150048	3.10	Learn and apply new information.	Select one	1: not applicable	2: not at all

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	1: not applicable	2: not at all
150050	3.12	Communicate ideas effectively.	Select one	1: not applicable	2: not at all
870		**Attitudes**	Category		
871	4	Presently, I am...	Category		
150670	4.1	Enthusiastic about cell and molecular biology	Select one	1: not applicable	2: not at all
150671	4.2	Interested in taking or planning to take additional courses in cell and molecular biology	Select one	1: not applicable	2: not at all
150672	4.3	Confident that I understand cell and molecular biology	Select one	1: not applicable	2: not at all
134908	4.4	Confident that I can perform well in future Biology courses	Select one	1: not applicable	2: not at all
877	4.5	Comfortable working with complex ideas	Select one	1: not applicable	2: not at all
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	1: not applicable	2: not at all
134909	4.7	intimidated by the prospect of speaking in class	Select one	1: not applicable	2: not at all
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	1: not applicable	2: not at all
880		**Integration of learning**	Category		
881	5	Presently, I am in the habit of...	Category		
883	5.1	Applying what I learn in classes to other situations	Select one	1: not applicable	2: not at all
884	5.2	Using systematic reasoning in my approach to problems	Select one	1: not applicable	2: not at all
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	1: not applicable	2: not at all
134910		**Major and goals**	Category		
888	6	What best characterizes your major in college?	Category		
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
891	6.3	Undecided at this time	Select one	1: Yes	2: No
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	1: Yes	2: No

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

894		**GPA**	Category		
895	7	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category		
150906	7.1	My GPA is... (please skip if you are a first-semester freshman)	Select one	1: 4.00-3.60	2: 3.01-3.59
134916		**student information**	Category		
134917	8	Please enter information below to help me interpret the survey results and improve the course	Category		
134918	8.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer		
150036	8.2	Please ignore this question.	Select one	1: Section A (9:30 AM)	2: Section B (12:30 PM)

3: 2.51-3.00	4: 2.01-2.50	5: 2.00 or lower	

ID	Numl	Question	Type	N	Mean	Std dev
826		**Understanding**	Category			
827	1	Presently, I understand...	Category			
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	37	4.6	0.86
22435	1.2	How studying topics in this course help people address real world issues	Select one	37	5.0	0.76
858		**Skills**	Category			
869	2	Presently, I can...	Category			
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	37	4.3	1.07
865	2.2	Write documents in discipline-appropriate style and format	Select one	37	4.1	1.17
866	2.3	Work effectively with others	Select one	37	5.3	0.70
150037		**Critical Thinking Skills**	Category			
150038	3	Presently, I can...	Category			
150039	3.1	Separate factual information from inferences.	Select one	37	4.8	0.88
150040	3.2	Interpret numerical relationships in graphs.	Select one	37	4.9	0.86
150041	3.3	Understand the limitations of correlational data.	Select one	37	4.2	0.95
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	37	4.4	0.90
150043	3.5	Identify alternative interpretations for data or observations.	Select one	37	4.1	0.82
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	37	4.4	0.83
150045	3.7	Explain how new information can change a problem.	Select one	37	4.6	0.87
150046	3.8	Separate relevant from irrelevant information.	Select one	37	4.7	0.84
150047	3.9	Integrate information to solve problems.	Select one	37	4.5	1.04
150048	3.10	Learn and apply new information.	Select one	37	4.8	0.64

Choices...					
1: 0%	2: 0%	3: 8%	4: 24%	5: 33%	6: 10%
1: 0%	2: 0%	3: 2%	4: 14%	5: 39%	6: 20%
1: 0%	2: 4%	3: 12%	4: 29%	5: 20%	6: 10%
1: 2%	2: 6%	3: 10%	4: 27%	5: 24%	6: 6%
1: 0%	2: 0%	3: 2%	4: 4%	5: 39%	6: 31%
1: 0%	2: 2%	3: 2%	4: 18%	5: 39%	6: 14%
1: 0%	2: 0%	3: 6%	4: 14%	5: 39%	6: 16%
1: 0%	2: 6%	3: 4%	4: 37%	5: 24%	6: 4%
1: 0%	2: 2%	3: 6%	4: 35%	5: 24%	6: 8%
1: 0%	2: 2%	3: 14%	4: 31%	5: 29%	6: 0%
1: 0%	2: 2%	3: 8%	4: 24%	5: 39%	6: 2%
1: 0%	2: 0%	3: 10%	4: 20%	5: 37%	6: 8%
1: 0%	2: 0%	3: 6%	4: 20%	5: 37%	6: 12%
1: 2%	2: 4%	3: 2%	4: 18%	5: 45%	6: 4%
1: 0%	2: 0%	3: 2%	4: 20%	5: 47%	6: 6%

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	37	4.5	0.96
150050	3.12	Communicate ideas effectively.	Select one	37	4.9	0.84
870		**Attitudes**	Category			
871	4	Presently, I am...	Category			
150670	4.1	Enthusiastic about cell and molecular biology	Select one	37	4.7	0.90
150671	4.2	Interested in taking or planning to take additional courses in cell and molecular biology	Select one	37	4.6	1.07
150672	4.3	Confident that I understand cell and molecular biology	Select one	37	4.0	0.90
134908	4.4	Confident that I can perform well in future Biology courses	Select one	37	4.7	0.88
877	4.5	Comfortable working with complex ideas	Select one	37	4.4	0.89
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	37	5.2	0.85
134909	4.7	intimidated by the prospect of speaking in class	Select one	37	3.4	1.28
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	37	4.1	1.09
880		**Integration of learning**	Category			
881	5	Presently, I am in the habit of...	Category			
883	5.1	Applying what I learn in classes to other situations	Select one	37	4.3	0.90
884	5.2	Using systematic reasoning in my approach to problems	Select one	37	4.3	1.03
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	37	4.4	0.82
134910		**Major and goals**	Category			
888	6	What best characterizes your major in college?	Category			
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	37		0.35
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	37		0.28
891	6.3	Undecided at this time	Select one	37		0.42
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	37		0.23

1: 0%	2: 0%	3: 12%	4: 29%	5: 22%	6: 12%
1: 0%	2: 0%	3: 4%	4: 18%	5: 35%	6: 18%
1: 0%	2: 0%	3: 6%	4: 24%	5: 29%	6: 16%
1: 0%	2: 2%	3: 10%	4: 20%	5: 27%	6: 16%
1: 0%	2: 2%	3: 18%	4: 35%	5: 16%	6: 4%
1: 0%	2: 0%	3: 6%	4: 27%	5: 29%	6: 14%
1: 0%	2: 0%	3: 14%	4: 27%	5: 29%	6: 6%
1: 0%	2: 0%	3: 2%	4: 14%	5: 24%	6: 35%
1: 0%	2: 22%	3: 20%	4: 20%	5: 4%	6: 8%
1: 2%	2: 6%	3: 6%	4: 35%	5: 22%	6: 4%
1: 0%	2: 2%	3: 10%	4: 35%	5: 22%	6: 6%
1: 2%	2: 0%	3: 12%	4: 24%	5: 31%	6: 6%
1: 0%	2: 0%	3: 12%	4: 29%	5: 31%	6: 4%
1: 65%	2: 10%				
1: 6%	2: 69%				
1: 16%	2: 59%				
1: 71%	2: 4%				

894		**GPA**	Category			
895	7	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category			
150906	7.1	My GPA is... (please skip if you are a first-semester freshman)	Select one	37	1.3	0.58
134916		**student information**	Category			
134917	8	Please enter information below to help me interpret the survey results and improve the course	Category			
134918	8.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer	35		
150036	8.2	Please ignore this question.	Select one	37		0.28

1: 55%	2: 16%	3: 4%	4: 0%	5: 0%	
1: 6%	2: 69%				

SALG - Student Assessment of their Learning Gains

Melanie Styers, ,
Instrument #72110, ,
Administered Mon Nov 23, 2015 - Mon Nov 30, 2015

http://www.salgsite.org/

ID	Numl	Question	Type	Choices...	
826		**Understanding**	Category		
827	1	Presently, I understand...	Category		
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	1: not applicable	2: not at all
22435	1.2	How studying topics in this course help people address real world issues	Select one	1: not applicable	2: not at all
858		**Skills**	Category		
869	2	Presently, I can...	Category		
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	1: not applicable	2: not at all
865	2.2	Write documents in discipline-appropriate style and format	Select one	1: not applicable	2: not at all
866	2.3	Work effectively with others	Select one	1: not applicable	2: not at all
150037		**Critical Thinking Skills**	Category		
150038	3	Presently, I can...	Category		
150039	3.1	Separate factual information from inferences.	Select one	1: not applicable	2: not at all
150040	3.2	Interpret numerical relationships in graphs.	Select one	1: not applicable	2: not at all
150041	3.3	Understand the limitations of correlational data.	Select one	1: not applicable	2: not at all
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	1: not applicable	2: not at all
150043	3.5	Identify alternative interpretations for data or observations.	Select one	1: not applicable	2: not at all
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	1: not applicable	2: not at all
150045	3.7	Explain how new information can change a problem.	Select one	1: not applicable	2: not at all
150046	3.8	Separate relevant from irrelevant information.	Select one	1: not applicable	2: not at all
150047	3.9	Integrate information to solve problems.	Select one	1: not applicable	2: not at all
150048	3.10	Learn and apply new information.	Select one	1: not applicable	2: not at all

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	1: not applicable	2: not at all
150050	3.12	Communicate ideas effectively.	Select one	1: not applicable	2: not at all
870		**Attitudes**	Category		
871	4	Presently, I am...	Category		
150670	4.1	Enthusiastic about cell and molecular biology	Select one	1: not applicable	2: not at all
150671	4.2	Interested in taking or planning to take additional courses in cell and molecular biology	Select one	1: not applicable	2: not at all
150672	4.3	Confident that I understand cell and molecular biology	Select one	1: not applicable	2: not at all
134908	4.4	Confident that I can perform well in future Biology courses	Select one	1: not applicable	2: not at all
877	4.5	Comfortable working with complex ideas	Select one	1: not applicable	2: not at all
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	1: not applicable	2: not at all
134909	4.7	intimidated by the prospect of speaking in class	Select one	1: not applicable	2: not at all
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	1: not applicable	2: not at all
880		**Integration of learning**	Category		
881	5	Presently, I am in the habit of...	Category		
883	5.1	Applying what I learn in classes to other situations	Select one	1: not applicable	2: not at all
884	5.2	Using systematic reasoning in my approach to problems	Select one	1: not applicable	2: not at all
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	1: not applicable	2: not at all
134910		**Major and goals**	Category		
888	6	What best characterizes your major in college?	Category		
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
891	6.3	Undecided at this time	Select one	1: Yes	2: No
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	1: Yes	2: No

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

134916		**student information**	Category		
134917	7	Please enter information below to help me interpret the survey results and improve the course	Category		
134918	7.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer		
154601	7.2	Just select one of the two options here (I couldn't delete this question.)	Select one	1: Section A (9:30 AM)	2: Section B (12:30 PM)
154602		**Student investment**	Category		
154603	8	In an average week, how much time did you spend on this class in the following areas?	Category		
154604	8.1	Reading the book.	Select one	1: none	2: a little
154605	8.2	Watching course-related videos produced by Dr. Styers.	Select one	1: none	2: a little
154606	8.3	Reviewing your notes.	Select one	1: none	2: a little
154607	8.4	Reviewing materials online (powerpoints, clickers, supplemental videos).	Select one	1: none	2: a little
154608	8.5	Attending tutoring.	Select one	1: none	2: a little
154609	8.6	Studying with other students in the class.	Select one	1: none	2: a little
154610		**Student effort**	Category		
154611	9	Compared to other BSC science courses, rate this course in terms of the following areas:	Category		
154612	9.1	Amount of critical thinking you had to do (versus memorization).	Select one	1: none	2: a little
154613	9.2	Amount of assigned work (lecture only)	Select one	1: none	2: a little
154614	9.3	Amount of assigned work (lab only)	Select one	1: none	2: a little
154615	9.4	Amount of effort you put in throughout the semester	Select one	1: none	2: a little

3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable
3: some	4: a fair amount	5: a great deal	9: not applicable

154616	9.5	How much you learned	Select one	1: none	2: a little

3: some	4: a fair amount	5: a great deal	9: not applicable

ID	Numl	Question	Type	N	Mean	Std dev
826		**Understanding**	Category			
827	1	Presently, I understand...	Category			
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	33	5.0	0.92
22435	1.2	How studying topics in this course help people address real world issues	Select one	33	5.4	0.78
858		**Skills**	Category			
869	2	Presently, I can...	Category			
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	33	4.9	0.97
865	2.2	Write documents in discipline-appropriate style and format	Select one	33	4.5	0.91
866	2.3	Work effectively with others	Select one	33	5.5	0.62
150037		**Critical Thinking Skills**	Category			
150038	3	Presently, I can...	Category			
150039	3.1	Separate factual information from inferences.	Select one	33	5.1	0.86
150040	3.2	Interpret numerical relationships in graphs.	Select one	33	5.3	0.73
150041	3.3	Understand the limitations of correlational data.	Select one	33	4.9	0.90
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	33	4.8	0.70
150043	3.5	Identify alternative interpretations for data or observations.	Select one	33	4.7	0.92
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	33	4.7	0.81
150045	3.7	Explain how new information can change a problem.	Select one	33	5.0	0.75
150046	3.8	Separate relevant from irrelevant information.	Select one	33	5.1	0.89
150047	3.9	Integrate information to solve problems.	Select one	33	4.9	0.88
150048	3.10	Learn and apply new information.	Select one	33	5.0	0.83

Choices...					
1: 0%	2: 0%	3: 9%	4: 12%	5: 45%	6: 33%
1: 0%	2: 0%	3: 0%	4: 18%	5: 27%	6: 55%
1: 0%	2: 3%	3: 0%	4: 30%	5: 33%	6: 33%
1: 0%	2: 3%	3: 6%	4: 39%	5: 39%	6: 12%
1: 0%	2: 0%	3: 0%	4: 6%	5: 42%	6: 52%
1: 0%	2: 0%	3: 6%	4: 12%	5: 45%	6: 36%
1: 0%	2: 0%	3: 0%	4: 15%	5: 39%	6: 45%
1: 0%	2: 0%	3: 6%	4: 24%	5: 39%	6: 30%
1: 0%	2: 0%	3: 0%	4: 36%	5: 48%	6: 15%
1: 0%	2: 0%	3: 9%	4: 33%	5: 36%	6: 21%
1: 0%	2: 0%	3: 3%	4: 42%	5: 36%	6: 18%
1: 0%	2: 0%	3: 0%	4: 27%	5: 45%	6: 27%
1: 0%	2: 3%	3: 0%	4: 15%	5: 45%	6: 36%
1: 0%	2: 0%	3: 6%	4: 24%	5: 42%	6: 27%
1: 0%	2: 0%	3: 3%	4: 24%	5: 42%	6: 30%

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	33	4.9	0.93
150050	3.12	Communicate ideas effectively.	Select one	33	5.2	0.75
870		**Attitudes**	Category			
871	4	Presently, I am...	Category			
150670	4.1	Enthusiastic about cell and molecular biology	Select one	33	4.5	0.94
150671	4.2	Interested in taking or planning to take additional courses in cell and molecular biology	Select one	33	4.2	1.26
150672	4.3	Confident that I understand cell and molecular biology	Select one	33	4.3	1.13
134908	4.4	Confident that I can perform well in future Biology courses	Select one	33	4.6	1.06
877	4.5	Comfortable working with complex ideas	Select one	33	4.5	1.03
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	33	5.2	0.92
134909	4.7	intimidated by the prospect of speaking in class	Select one	33	3.7	1.42
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	33	4.0	1.05
880		**Integration of learning**	Category			
881	5	Presently, I am in the habit of...	Category			
883	5.1	Applying what I learn in classes to other situations	Select one	33	4.6	0.99
884	5.2	Using systematic reasoning in my approach to problems	Select one	33	4.6	0.96
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	33	4.7	0.85
134910		**Major and goals**	Category			
888	6	What best characterizes your major in college?	Category			
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	33		0.17
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	33		0.29
891	6.3	Undecided at this time	Select one	33		0.36
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	33		0.33

1: 0%	2: 0%	3: 6%	4: 30%	5: 33%	6: 30%
1: 0%	2: 0%	3: 0%	4: 18%	5: 39%	6: 42%
1: 0%	2: 0%	3: 9%	4: 48%	5: 21%	6: 21%
1: 0%	2: 9%	3: 21%	4: 33%	5: 15%	6: 21%
1: 0%	2: 6%	3: 18%	4: 30%	5: 30%	6: 15%
1: 0%	2: 3%	3: 9%	4: 39%	5: 24%	6: 24%
1: 0%	2: 3%	3: 12%	4: 36%	5: 30%	6: 18%
1: 0%	2: 3%	3: 0%	4: 15%	5: 39%	6: 42%
1: 3%	2: 24%	3: 9%	4: 39%	5: 9%	6: 15%
1: 0%	2: 6%	3: 24%	4: 39%	5: 21%	6: 9%
1: 0%	2: 0%	3: 12%	4: 36%	5: 27%	6: 24%
1: 0%	2: 3%	3: 3%	4: 42%	5: 30%	6: 21%
1: 0%	2: 0%	3: 6%	4: 39%	5: 36%	6: 18%
1: 97%	2: 3%				
1: 9%	2: 91%				
1: 15%	2: 85%				
1: 88%	2: 12%				

134916		**student information**	Category			
134917	7	Please enter information below to help me interpret the survey results and improve the course	Category			
134918	7.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer	32		
154601	7.2	Just select one of the two options here (I couldn't delete this question.)	Select one	33		0.29
154602		**Student investment**	Category			
154603	8	In an average week, how much time did you spend on this class in the following areas?	Category			
154604	8.1	Reading the book.	Select one	33	3.3	1.31
154605	8.2	Watching course-related videos produced by Dr. Styers.	Select one	33	4.2	0.92
154606	8.3	Reviewing your notes.	Select one	33	4.5	0.67
154607	8.4	Reviewing materials online (powerpoints, clickers, supplemental videos).	Select one	33	4.0	1.10
154608	8.5	Attending tutoring.	Select one	33	2.6	1.66
154609	8.6	Studying with other students in the class.	Select one	32	3.6	1.29
154610		**Student effort**	Category			
154611	9	Compared to other BSC science courses, rate this course in terms of the following areas:	Category			
154612	9.1	Amount of critical thinking you had to do (versus memorization).	Select one	30	4.5	0.63
154613	9.2	Amount of assigned work (lecture only)	Select one	29	3.7	0.97
154614	9.3	Amount of assigned work (lab only)	Select one	30	4.3	0.70
154615	9.4	Amount of effort you put in throughout the semester	Select one	30	4.7	0.52

1: 9%	2: 91%				
1: 12%	2: 15%	3: 24%	4: 27%	5: 21%	9: 0%
1: 0%	2: 3%	3: 24%	4: 24%	5: 48%	9: 0%
1: 0%	2: 0%	3: 9%	4: 33%	5: 58%	9: 0%
1: 3%	2: 9%	3: 15%	4: 33%	5: 39%	9: 0%
1: 42%	2: 12%	3: 15%	4: 6%	5: 24%	9: 0%
1: 9%	2: 12%	3: 18%	4: 30%	5: 27%	9: 3%
1: 0%	2: 0%	3: 6%	4: 30%	5: 55%	9: 9%
1: 0%	2: 12%	3: 21%	4: 36%	5: 18%	9: 12%
1: 0%	2: 3%	3: 3%	4: 48%	5: 36%	9: 9%
1: 0%	2: 0%	3: 3%	4: 18%	5: 70%	9: 9%

154616	9.5	How much you learned	Select one	30	4.7	0.55

1: 0%	2: 0%	3: 3%	4: 24%	5: 64%	9: 9%

SALG - Student Assessment of their Learning Gains

Peter Van Zandt, ,
Instrument #71210, BI 225 (pre), Fall 2015
Administered Mon Aug 31, 2015 - Sat Sep 05, 2015

http://www.salgsite.org/

ID	Numl	Question	Type	Choices...	
826		**Understanding**	Category		
827	1	Presently, I understand...	Category		
134900	1.1	(for each of the following, indicate your level of current understanding)	Category		
149971	1.1.1	The distinction between scientific ideas and non-scientific ideas	Select one	1: not applicable	2: not at all
22431	1.1.2	Darwin's theory of common descent and theory of natural selection	Select one	1: not applicable	2: not at all
22409	1.1.3	How natural populations evolve	Select one	1: not applicable	2: not at all
22410	1.1.4	Similarities and differences among species concepts	Select one	1: not applicable	2: not at all
22417	1.1.5	Population structure and dynamics	Select one	1: not applicable	2: not at all
22414	1.1.6	Mechanisms of macroevolution	Select one	1: not applicable	2: not at all
22418	1.1.7	Structure and dynamics of natural communities	Select one	1: not applicable	2: not at all
134901	1.1.8	Threats to biodiversity	Select one	1: not applicable	2: not at all
134902	1.1.9	The coolness of EvoEco	Select one	1: not applicable	2: not at all
134903	1.1.10	Evolution occurs within individuals	Select one	1: not applicable	2: not at all
22435	1.2	How studying topics in this course help people address real world issues	Select one	1: not applicable	2: not at all
125130	1.3	Shared ancestry explains most similarity among divergent organisms	Select one	1: not applicable	2: not at all
125133	1.4	Mutation is random, mostly deleterious, and is the source of heritable variation	Select one	1: not applicable	2: not at all
125134	1.5	Most evolution happens as a consequence of selection acting on heritable variation	Select one	1: not applicable	2: not at all
22436	1.6	What do you expect to understand at the end of the class that you do not know now? (Please be as specific as possible.)	Long answer		
858		**Skills**	Category		
869	2	Presently, I can...	Category		

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	1: not applicable	2: not at all
22437	2.2	Critically read articles about issues raised in this class	Select one	1: not applicable	2: not at all
863	2.3	Recognize a sound argument and appropriate use of evidence	Select one	1: not applicable	2: not at all
865	2.4	Write documents in discipline-appropriate style and format	Select one	1: not applicable	2: not at all
866	2.5	Work effectively with others	Select one	1: not applicable	2: not at all
134904	2.6	Brush my teeth regularly and effectively	Select one	1: not applicable	2: not at all
125138	2.7	Collaborate with people of varying knowledge and points of view toward common goals	Select one	1: not applicable	2: not at all
134906	2.8	Communicate with brevity, clarity, and scientific persuasion	Select one	1: not applicable	2: not at all
150810	2.9	Separate factual information from inferences.	Select one	1: not applicable	2: not at all
150811	2.10	Interpret numerical relationships in graphs.	Select one	1: not applicable	2: not at all
150812	2.11	Understand the limitations of correlational data.	Select one	1: not applicable	2: not at all
150813	2.12	Evaluate evidence and identify inappropriate conclusions.	Select one	1: not applicable	2: not at all
150814	2.13	Identify alternative interpretations for data or observations.	Select one	1: not applicable	2: not at all
150815	2.14	Identify new information that might support or contradict a hypothesis.	Select one	1: not applicable	2: not at all
150816	2.15	Explain how new information can change a problem.	Select one	1: not applicable	2: not at all
150817	2.16	Separate relevant from irrelevant information.	Select one	1: not applicable	2: not at all
150818	2.17	Use mathematical skills to solve real-world problems.	Select one	1: not applicable	2: not at all
134907	2.18	What do you expect to be able to do better by the end of the course?	Long answer		
870		**Attitudes**	Category		
871	3	Presently, I am...	Category		
22439	3.1	Enthusiastic about ecology and/or evolution	Select one	1: not applicable	2: not at all

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

22440	3.2	Interested in discussing ecology and/or evolution with friends or family	Select one	1: not applicable	2: not at all
22441	3.3	Interested in taking or planning to take additional classes in ecology and/or evolution	Select one	1: not applicable	2: not at all
22442	3.4	Confident that I understand ecology and/or evolution	Select one	1: not applicable	2: not at all
134908	3.5	Confident that I can perform well in future Biology courses	Select one	1: not applicable	2: not at all
877	3.6	Comfortable working with complex ideas	Select one	1: not applicable	2: not at all
878	3.7	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	1: not applicable	2: not at all
134909	3.8	intimidated by the prospect of speaking in class	Select one	1: not applicable	2: not at all
134915	3.9	thinking that science is an accumulation of facts, rules, and formulas.	Select one	1: not applicable	2: not at all
22444	3.10	Please comment on your present level of interest in ecology and/or evolution.	Long answer		
880		**Integration of learning**	Category		
881	4	Presently, I am in the habit of...	Category		
883	4.1	Applying what I learn in classes to other situations	Select one	1: not applicable	2: not at all
884	4.2	Using systematic reasoning in my approach to problems	Select one	1: not applicable	2: not at all
885	4.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	1: not applicable	2: not at all
886	4.4	Please comment on how you expect this material to integrate with your studies, career, and/or life?	Long answer		
134910		**Major and goals**	Category		
888	5	What best characterizes your major in college?	Category		
22445	5.1	Major is in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
22446	5.2	Not a major in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
891	5.3	Undecided at this time	Select one	1: Yes	2: No
134911	5.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	1: Yes	2: No
894		**GPA**	Category		

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

895	6	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category		
896	6.1	My GPA is...	Select one	1: 4.00-3.60	2: 3.01-3.59
134916		**student information**	Category		
134917	7	Please enter information below to help me interpret the survey results and improve the course	Category		
134918	7.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer		
134919	7.2	Please tell me which section of EvoEco you are in	Select one	1: Section A (9:30 AM)	2: Section B (12:30 PM)

3: 2.51-3.00	4: 2.01-2.50	5: 2.00 or lower	

ID	Numl	Question	Type	N	Mean	Std dev
826		**Understanding**	Category			
827	1	Presently, I understand...	Category			
134900	1.1	(for each of the following, indicate your level of current understanding)	Category			
149971	1.1.1	The distinction between scientific ideas and non-scientific ideas	Select one	20	4.3	0.88
22431	1.1.2	Darwin's theory of common descent and theory of natural selection	Select one	20	4.5	0.76
22409	1.1.3	How natural populations evolve	Select one	20	4.0	0.94
22410	1.1.4	Similarities and differences among species concepts	Select one	20	4.0	0.92
22417	1.1.5	Population structure and dynamics	Select one	20	3.5	0.76
22414	1.1.6	Mechanisms of macroevolution	Select one	20	3.0	0.97
22418	1.1.7	Structure and dynamics of natural communities	Select one	20	3.1	0.81
134901	1.1.8	Threats to biodiversity	Select one	20	4.0	1.12
134902	1.1.9	The coolness of EvoEco	Select one	20	4.4	1.39
134903	1.1.10	Evolution occurs within individuals	Select one	20	4.5	1.15
22435	1.2	How studying topics in this course help people address real world issues	Select one	20	4.6	0.94
125130	1.3	Shared ancestry explains most similarity among divergent organisms	Select one	20	4.2	1.24
125133	1.4	Mutation is random, mostly deleterious, and is the source of heritable variation	Select one	20	4.3	1.23
125134	1.5	Most evolution happens as a consequence of selection acting on heritable variation	Select one	20	4.0	1.32
22436	1.6	What do you expect to understand at the end of the class that you do not know now? (Please be as specific as possible.)	Long answer	20		
858		**Skills**	Category			
869	2	Presently, I can...	Category			

Choices...					
1: 0%	2: 3%	3: 0%	4: 39%	5: 16%	6: 6%
1: 0%	2: 0%	3: 6%	4: 23%	5: 32%	6: 3%
1: 0%	2: 3%	3: 10%	4: 39%	5: 6%	6: 6%
1: 0%	2: 0%	3: 19%	4: 32%	5: 6%	6: 6%
1: 0%	2: 3%	3: 32%	4: 23%	5: 6%	6: 0%
1: 0%	2: 26%	3: 16%	4: 19%	5: 3%	6: 0%
1: 0%	2: 13%	3: 32%	4: 16%	5: 3%	6: 0%
1: 0%	2: 6%	3: 16%	4: 16%	5: 23%	6: 3%
1: 3%	2: 0%	3: 13%	4: 16%	5: 13%	6: 19%
1: 0%	2: 3%	3: 10%	4: 19%	5: 19%	6: 13%
1: 0%	2: 0%	3: 6%	4: 26%	5: 19%	6: 13%
1: 3%	2: 0%	3: 13%	4: 23%	5: 16%	6: 10%
1: 3%	2: 0%	3: 13%	4: 10%	5: 32%	6: 6%
1: 3%	2: 3%	3: 13%	4: 23%	5: 13%	6: 10%

860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	20	4.8	0.88
22437	2.2	Critically read articles about issues raised in this class (learn and apply)	Select one	20	4.5	0.76
863	2.3	Recognize a sound argument and appropriate use of evidence Iintegrate information to solve problems)	Select one	20	4.5	0.76
865	2.4	Write documents in discipline-appropriate style and format	Select one	20	4.3	0.93
866	2.5	Work effectively with others	Select one	20	5.2	0.77
134904	2.6	Brush my teeth regularly and effectively	Select one	20	5.7	0.67
125138	2.7	Collaborate with people of varying knowledge and points of view toward common goals	Select one	20	5.2	0.77
134906	2.8	Communicate with brevity, clarity, and scientific persuasion (communicate effectively)	Select one	20	4.5	0.94
150810	2.9	Separate factual information from inferences.	Select one	20	4.5	0.89
150811	2.10	Interpret numerical relationships in graphs.	Select one	20	4.4	0.99
150812	2.11	Understand the limitations of correlational data.	Select one	20	4.2	1.20
150813	2.12	Evaluate evidence and identify inappropriate conclusions.	Select one	20	4.1	1.02
150814	2.13	Identify alternative interpretations for data or observations.	Select one	20	4.3	1.17
150815	2.14	Identify new information that might support or contradict a hypothesis.	Select one	20	4.5	0.95
150816	2.15	Explain how new information can change a problem.	Select one	20	4.4	0.88
150817	2.16	Separate relevant from irrelevant information.	Select one	20	4.6	1.04
150818	2.17	Use mathematical skills to solve real-world problems.	Select one	20	4.6	1.19
134907	2.18	What do you expect to be able to do better by the end of the course?	Long answer	20		
870		**Attitudes**	Category			
871	3	Presently, I am...	Category			

1: 0%	2: 0%	3: 3%	4: 19%	5: 26%	6: 16%
1: 0%	2: 0%	3: 3%	4: 32%	5: 23%	6: 6%
1: 0%	2: 0%	3: 6%	4: 23%	5: 32%	6: 3%
1: 0%	2: 3%	3: 6%	4: 23%	5: 29%	6: 3%
1: 0%	2: 0%	3: 0%	4: 13%	5: 26%	6: 26%
1: 0%	2: 0%	3: 0%	4: 6%	5: 10%	6: 48%
1: 0%	2: 0%	3: 0%	4: 13%	5: 26%	6: 26%
1: 0%	2: 3%	3: 0%	4: 29%	5: 23%	6: 10%
1: 0%	2: 0%	3: 10%	4: 23%	5: 26%	6: 6%
1: 0%	2: 3%	3: 6%	4: 23%	5: 26%	6: 6%
1: 0%	2: 6%	3: 10%	4: 23%	5: 16%	6: 10%
1: 0%	2: 3%	3: 16%	4: 19%	5: 23%	6: 3%
1: 0%	2: 3%	3: 16%	4: 13%	5: 23%	6: 10%
1: 0%	2: 0%	3: 10%	4: 23%	5: 23%	6: 10%
1: 0%	2: 0%	3: 10%	4: 26%	5: 23%	6: 6%
1: 0%	2: 0%	3: 10%	4: 19%	5: 19%	6: 16%
1: 0%	2: 3%	3: 10%	4: 13%	5: 23%	6: 16%

22439	3.1	Enthusiastic about ecology and/or evolution	Select one	20	4.8	0.97
22440	3.2	Interested in discussing ecology and/or evolution with friends or family	Select one	20	4.2	1.12
22441	3.3	Interested in taking or planning to take additional classes in ecology and/or evolution	Select one	20	3.5	1.15
22442	3.4	Confident that I understand ecology and/or evolution	Select one	20	4.1	1.04
134908	3.5	Confident that I can perform well in future Biology courses	Select one	20	4.7	1.09
877	3.6	Comfortable working with complex ideas	Select one	20	4.6	0.94
878	3.7	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	20	5.1	1.07
134909	3.8	intimidated by the prospect of speaking in class	Select one	20	3.2	1.29
134915	3.9	thinking that science is an accumulation of facts, rules, and formulas.	Select one	20	3.6	1.19
22444	3.10	Please comment on your present level of interest in ecology and/or evolution.	Long answer	20		
880		**Integration of learning**	Category			
881	4	Presently, I am in the habit of...	Category			
883	4.1	Applying what I learn in classes to other situations	Select one	20	4.6	0.75
884	4.2	Using systematic reasoning in my approach to problems	Select one	20	4.4	0.94
885	4.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	20	4.3	0.92
886	4.4	Please comment on how you expect this material to integrate with your studies, career, and/or life?	Long answer	20		
134910		**Major and goals**	Category			
888	5	What best characterizes your major in college?	Category			
22445	5.1	Major is in the sciences (life, physical, etc.)	Select one	20		0.37
22446	5.2	Not a major in the sciences (life, physical, etc.)	Select one	20		0.37
891	5.3	Undecided at this time	Select one	20		0.22
134911	5.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	20		0.47

1: 0%	2: 0%	3: 6%	4: 19%	5: 23%	6: 16%
1: 0%	2: 3%	3: 13%	4: 23%	5: 16%	6: 10%
1: 0%	2: 19%	3: 6%	4: 26%	5: 13%	6: 0%
1: 0%	2: 0%	3: 23%	4: 16%	5: 19%	6: 6%
1: 0%	2: 3%	3: 6%	4: 13%	5: 29%	6: 13%
1: 0%	2: 0%	3: 6%	4: 26%	5: 19%	6: 13%
1: 0%	2: 0%	3: 10%	4: 3%	5: 23%	6: 29%
1: 3%	2: 13%	3: 29%	4: 10%	5: 3%	6: 6%
1: 3%	2: 10%	3: 13%	4: 29%	5: 6%	6: 3%
1: 0%	2: 0%	3: 3%	4: 26%	5: 29%	6: 6%
1: 0%	2: 3%	3: 6%	4: 19%	5: 32%	6: 3%
1: 0%	2: 6%	3: 0%	4: 26%	5: 32%	6: 0%
1: 55%	2: 10%				
1: 10%	2: 55%				
1: 3%	2: 61%				
1: 45%	2: 19%				

894		**GPA**	Category			
895	6	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category			
896	6.1	My GPA is...	Select one	20	2.0	0.79
134916		**student information**	Category			
134917	7	Please enter information below to help me interpret the survey results and improve the course	Category			
134918	7.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer	20		
134919	7.2	Please tell me which section of EvoEco you are in	Select one	20		0.44

1: 16%	2: 35%	3: 10%	4: 3%	5: 0%	
1: 48%	2: 16%				

SALG - Student Assessment of their Learning Gains

Peter Van Zandt, ,

Instrument #72084, Evolutionary Ecology BI 225 (post), Fall 2015

Administered Mon Nov 30, 2015 - Sat Dec 12, 2015

http://www.salgsite.org/

ID	Numl	Question	Type	Choices...	
826		**Understanding**	Category		
827	1	Presently, I understand...	Category		
154040	1.1	(Now that you've finished the course, please indicate your level of current understanding)	Category		
149971	1.1.1	The distinction between scientific ideas and non-scientific ideas	Select one	1: not applicable	2: not at all
22431	1.1.2	Darwin's theory of common descent and theory of natural selection	Select one	1: not applicable	2: not at all
22409	1.1.3	How natural populations evolve	Select one	1: not applicable	2: not at all
22410	1.1.4	Similarities and differences among species concepts	Select one	1: not applicable	2: not at all
22417	1.1.5	Population structure and dynamics	Select one	1: not applicable	2: not at all
22414	1.1.6	Mechanisms of macroevolution	Select one	1: not applicable	2: not at all
22418	1.1.7	Structure and dynamics of natural communities	Select one	1: not applicable	2: not at all
134901	1.1.8	Threats to biodiversity	Select one	1: not applicable	2: not at all
134903	1.1.9	Evolution occurs within individuals	Select one	1: not applicable	2: not at all
22435	1.2	How studying topics in this course help people address real world issues	Select one	1: not applicable	2: not at all
125130	1.3	Shared ancestry explains most similarity among divergent organisms	Select one	1: not applicable	2: not at all
125133	1.4	Mutation is random, mostly deleterious, and is the source of heritable variation	Select one	1: not applicable	2: not at all
125134	1.5	Most evolution happens as a consequence of selection acting on heritable variation	Select one	1: not applicable	2: not at all
154039	1.6	What do you think you understand better after taking this class? (Please be as specific as possible.)	Long answer		
858		**Skills**	Category		
869	2	Presently, I can...	Category		
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	1: not applicable	2: not at all

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

22437	2.2	Critically read articles about issues raised in this class	Select one	1: not applicable	2: not at all
154043	2.3	Recognize a sound argument and appropriate use of evidence.	Select one	1: not applicable	2: not at all
154044	2.4	Write in a discipline-appropriate style and format.	Select one	1: not applicable	2: not at all
154045	2.5	Work effectively with others.	Select one	1: not applicable	2: not at all
134904	2.6	Brush my teeth regularly and effectively	Select one	1: not applicable	2: not at all
125138	2.7	Collaborate with people of varying knowledge and points of view toward common goals	Select one	1: not applicable	2: not at all
134906	2.8	Communicate with brevity, clarity, and scientific persuasion	Select one	1: not applicable	2: not at all
150810	2.9	Separate factual information from inferences.	Select one	1: not applicable	2: not at all
150811	2.10	Interpret numerical relationships in graphs.	Select one	1: not applicable	2: not at all
150812	2.11	Understand the limitations of correlational data.	Select one	1: not applicable	2: not at all
150813	2.12	Evaluate evidence and identify inappropriate conclusions.	Select one	1: not applicable	2: not at all
150814	2.13	Identify alternative interpretations for data or observations.	Select one	1: not applicable	2: not at all
150815	2.14	Identify new information that might support or contradict a hypothesis.	Select one	1: not applicable	2: not at all
150816	2.15	Explain how new information can change a problem.	Select one	1: not applicable	2: not at all
150817	2.16	Separate relevant from irrelevant information.	Select one	1: not applicable	2: not at all
150818	2.17	Use mathematical skills to solve real-world problems.	Select one	1: not applicable	2: not at all
154041	2.18	Have any of your skills improved after taking this course? If so, please describe here.	Long answer		
870		**Attitudes**	Category		
871	3	Presently, I am...	Category		

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

22439	3.1	Enthusiastic about ecology and/or evolution	Select one	1: not applicable	2: not at all
22440	3.2	Interested in discussing ecology and/or evolution with friends or family	Select one	1: not applicable	2: not at all
22441	3.3	Interested in taking or planning to take additional classes in ecology and/or evolution	Select one	1: not applicable	2: not at all
22442	3.4	Confident that I understand ecology and/or evolution	Select one	1: not applicable	2: not at all
134908	3.5	Confident that I can perform well in future Biology courses	Select one	1: not applicable	2: not at all
877	3.6	Comfortable working with complex ideas	Select one	1: not applicable	2: not at all
878	3.7	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	1: not applicable	2: not at all
134909	3.8	intimidated by the prospect of speaking in class	Select one	1: not applicable	2: not at all
134915	3.9	thinking that science is an accumulation of facts, rules, and formulas.	Select one	1: not applicable	2: not at all
22444	3.10	Please comment on your present level of interest in ecology and/or evolution.	Long answer		
880		**Integration of learning**	Category		
881	4	Presently, I am in the habit of...	Category		
883	4.1	Applying what I learn in classes to other situations	Select one	1: not applicable	2: not at all
884	4.2	Using systematic reasoning in my approach to problems	Select one	1: not applicable	2: not at all
885	4.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	1: not applicable	2: not at all
886	4.4	Please comment on how you expect this material to integrate with your studies, career, and/or life?	Long answer		
134910		**Major and goals**	Category		
888	5	What best characterizes your major in college?	Category		
22445	5.1	Major is in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
22446	5.2	Not a major in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
891	5.3	Undecided at this time	Select one	1: Yes	2: No
134911	5.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	1: Yes	2: No

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

894		**GPA**	Category		
895	6	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category		
896	6.1	My GPA is...	Select one	1: 4.00-3.60	2: 3.01-3.59
134916		**student information**	Category		
134917	7	Please enter information below to help me interpret the survey results and improve the course	Category		
134918	7.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer		
134919	7.2	Please tell me which section of EvoEco you are in	Select one	1: Section A (9:30 AM)	2: Section B (12:30 PM)
145165		**Student investment**	Category		
145166	8	In an average week, how many hours did you spend on this class in the following areas. Feel free to elaborate with comments where appropriate.	Category		
145167	8.1	reading the book	Select one	1: not applicable	2: not at all
145168	8.2	Reviewing your notes	Select one	1: not applicable	2: not at all
145169	8.3	Watching course-related videos	Select one	1: not applicable	2: not at all
145170	8.4	Studying for this class in other ways	Select one	1: not applicable	2: not at all
145171	8.5	How much total time per week did you spend on this class (excluding time in class and studying for exams)?	Select one	1: not applicable	2: not at all
145376		**Effort for this course**	Category		
145377	9	Compared to other Biology courses, rate this course in terms of the following areas	Category		
145379	9.1	Amount of critical thinking you had to do (i.e., versus memorization)	Select one	1: not applicable	2: not at all
145380	9.2	Amount of assigned work	Select one	1: not applicable	2: not at all
145381	9.3	How much effort you put in throughout the semester	Select one	1: not applicable	2: not at all

3: 2.51-3.00	4: 2.01-2.50	5: 2.00 or lower	
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

145382	9.4	How much you learned	Select one	1: not applicable	2: not at all
145383		**Course design and organization**	Category		
145384	10	Please comment on the overall effectiveness of the following course components. Where appropriate, include your thoughts on the usefulness of different assignments for accomplishing course goals (listed in syllabus)	Category		
145385	10.1	Focus on the interpretation of figures	Long answer		
145386	10.2	The use of pre-class videos (produced by others and by me) for delivering course content	Long answer		
145387	10.3	The peer editing process	Long answer		
145388	10.4	Summarizing a published paper in writing (recall that this is a WR course, so you may want to comment on whether you felt like this process improved your writing ability or not).	Long answer		
145389	10.5	Paper discussions (online and in class)	Long answer		
145390	10.6	Use of SimuText and other activities to explore class concepts	Long answer		
145391	10.7	Use of video and reading guides	Long answer		
145392	10.8	Quizzes as motivation for keeping up with reading	Long answer		
145393	10.9	The organization of the course Moodle page (both the layout of the home page and the use of topic-specific Moodle pages with learning objectives)	Long answer		
145394		**Additional feedback**	Category		
145395	11	Please comment freely on any other aspect of the course. Remember that I want to use these comments to improve the course, so the more detailed comments or suggestions you can offer the better.	Category		
145396	11.1	Here's a list of things to potentially comment on: the book (and how much you read it), the organization, difficulty level of exams, list of topics covered in class.	Long answer		

3: just a little	4: somewhat	5: a lot	6: a great deal

ID	Numl	Question	Type	N	Mean	Std dev
826		**Understanding**	Category			
827	1	Presently, I understand...	Category			
154040	1.1	(Now that you've finished the course, please indicate your level of current understanding)	Category			
149971	1.1.1	The distinction between scientific ideas and non-scientific ideas	Select one	25	5.1	0.57
22431	1.1.2	Darwin's theory of common descent and theory of natural selection	Select one	25	5.3	0.75
22409	1.1.3	How natural populations evolve	Select one	25	5.6	0.58
22410	1.1.4	Similarities and differences among species concepts	Select one	25	5.3	0.74
22417	1.1.5	Population structure and dynamics	Select one	25	5.0	0.84
22414	1.1.6	Mechanisms of macroevolution	Select one	25	4.8	0.75
22418	1.1.7	Structure and dynamics of natural communities	Select one	25	5.1	0.60
134901	1.1.8	Threats to biodiversity	Select one	25	5.4	0.70
134903	1.1.9	Evolution occurs within individuals	Select one	25	5.1	1.38
22435	1.2	How studying topics in this course help people address real world issues	Select one	25	5.4	0.65
125130	1.3	Shared ancestry explains most similarity among divergent organisms	Select one	25	5.3	0.69
125133	1.4	Mutation is random, mostly deleterious, and is the source of heritable variation	Select one	25	5.1	0.76
125134	1.5	Most evolution happens as a consequence of selection acting on heritable variation	Select one	25	5.2	0.80
154039	1.6	What do you think you understand better after taking this class? (Please be as specific as possible.)	Long answer	24		
858		**Skills**	Category			
869	2	Presently, I can...	Category			
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	25	5.2	0.65

Choices...					
1: 0%	2: 0%	3: 0%	4: 10%	5: 59%	6: 17%
1: 0%	2: 0%	3: 0%	4: 14%	5: 31%	6: 41%
1: 0%	2: 0%	3: 0%	4: 3%	5: 31%	6: 52%
1: 0%	2: 0%	3: 3%	4: 3%	5: 45%	6: 34%
1: 0%	2: 0%	3: 3%	4: 21%	5: 38%	6: 24%
1: 0%	2: 0%	3: 3%	4: 21%	5: 48%	6: 14%
1: 0%	2: 0%	3: 0%	4: 10%	5: 55%	6: 21%
1: 0%	2: 0%	3: 0%	4: 10%	5: 34%	6: 41%
1: 3%	2: 3%	3: 3%	4: 10%	5: 17%	6: 48%
1: 0%	2: 0%	3: 0%	4: 7%	5: 34%	6: 45%
1: 0%	2: 0%	3: 3%	4: 0%	5: 48%	6: 34%
1: 0%	2: 0%	3: 3%	4: 10%	5: 48%	6: 24%
1: 0%	2: 0%	3: 3%	4: 10%	5: 41%	6: 31%
1: 0%	2: 0%	3: 0%	4: 10%	5: 48%	6: 28%

22437	2.2	Critically read articles about issues raised in this class (learn and apply)	Select one	25	5.1	0.83
154043	2.3	Recognize a sound argument and appropriate use of evidence.	Select one	25	5.0	0.73
154044	2.4	Write in a discipline-appropriate style and format.	Select one	25	5.2	0.71
154045	2.5	Work effectively with others.	Select one	25	5.4	0.82
134904	2.6	Brush my teeth regularly and effectively	Select one	25	5.3	1.28
125138	2.7	Collaborate with people of varying knowledge and points of view toward common goals	Select one	25	5.5	0.59
134906	2.8	Communicate with brevity, clarity, and scientific persuasion	Select one	25	5.2	0.80
150810	2.9	Separate factual information from inferences.	Select one	25	5.2	0.62
150811	2.10	Interpret numerical relationships in graphs.	Select one	25	5.4	0.91
150812	2.11	Understand the limitations of correlational data.	Select one	25	5.0	1.10
150813	2.12	Evaluate evidence and identify inappropriate conclusions.	Select one	25	5.1	0.67
150814	2.13	Identify alternative interpretations for data or observations.	Select one	25	5.1	0.70
150815	2.14	Identify new information that might support or contradict a hypothesis.	Select one	25	5.3	0.63
150816	2.15	Explain how new information can change a problem.	Select one	25	5.3	0.75
150817	2.16	Separate relevant from irrelevant information.	Select one	25	5.4	0.65
150818	2.17	Use mathematical skills to solve real-world problems.	Select one	25	4.9	1.15
154041	2.18	Have any of your skills improved after taking this course? If so, please describe here.	Long answer	24		
870		**Attitudes**	Category			
871	3	Presently, I am...	Category			

1: 0%	2: 0%	3: 3%	4: 14%	5: 38%	6: 31%
1: 0%	2: 0%	3: 3%	4: 10%	5: 52%	6: 21%
1: 0%	2: 0%	3: 0%	4: 14%	5: 41%	6: 31%
1: 0%	2: 0%	3: 3%	4: 7%	5: 24%	6: 52%
1: 3%	2: 0%	3: 7%	4: 3%	5: 14%	6: 59%
1: 0%	2: 0%	3: 0%	4: 3%	5: 38%	6: 45%
1: 0%	2: 0%	3: 3%	4: 10%	5: 41%	6: 31%
1: 0%	2: 0%	3: 0%	4: 10%	5: 52%	6: 24%
1: 0%	2: 0%	3: 7%	4: 3%	5: 28%	6: 48%
1: 0%	2: 3%	3: 7%	4: 10%	5: 34%	6: 31%
1: 0%	2: 0%	3: 0%	4: 14%	5: 48%	6: 24%
1: 0%	2: 0%	3: 3%	4: 7%	5: 55%	6: 21%
1: 0%	2: 0%	3: 0%	4: 7%	5: 45%	6: 34%
1: 0%	2: 0%	3: 3%	4: 3%	5: 41%	6: 38%
1: 0%	2: 0%	3: 0%	4: 7%	5: 38%	6: 41%
1: 0%	2: 3%	3: 7%	4: 17%	5: 24%	6: 34%

22439	3.1	Enthusiastic about ecology and/or evolution	Select one	25	5.0	0.65
22440	3.2	Interested in discussing ecology and/or evolution with friends or family	Select one	25	4.9	0.95
22441	3.3	Interested in taking or planning to take additional classes in ecology and/or evolution	Select one	25	4.4	1.38
22442	3.4	Confident that I understand ecology and/or evolution	Select one	25	5.0	0.91
134908	3.5	Confident that I can perform well in future Biology courses	Select one	25	5.0	1.12
877	3.6	Comfortable working with complex ideas	Select one	25	5.2	0.85
878	3.7	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	25	5.2	1.04
134909	3.8	intimidated by the prospect of speaking in class	Select one	25	3.0	1.22
134915	3.9	thinking that science is an accumulation of facts, rules, and formulas.	Select one	25	3.1	1.32
22444	3.10	Please comment on your present level of interest in ecology and/or evolution.	Long answer	25		
880		**Integration of learning**	Category			
881	4	Presently, I am in the habit of...	Category			
883	4.1	Applying what I learn in classes to other situations	Select one	25	5.0	0.84
884	4.2	Using systematic reasoning in my approach to problems	Select one	25	5.3	0.68
885	4.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	25	5.2	0.85
886	4.4	Please comment on how you expect this material to integrate with your studies, career, and/or life?	Long answer	24		
134910		**Major and goals**	Category			
888	5	What best characterizes your major in college?	Category			
22445	5.1	Major is in the sciences (life, physical, etc.)	Select one	25		0.41
22446	5.2	Not a major in the sciences (life, physical, etc.)	Select one	25		0.46
891	5.3	Undecided at this time	Select one	25		0.00
134911	5.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	25		0.48

1: 0%	2: 0%	3: 0%	4: 17%	5: 52%	6: 17%
1: 0%	2: 0%	3: 10%	4: 10%	5: 41%	6: 24%
1: 3%	2: 3%	3: 14%	4: 24%	5: 17%	6: 24%
1: 0%	2: 3%	3: 0%	4: 14%	5: 45%	6: 24%
1: 0%	2: 3%	3: 7%	4: 10%	5: 31%	6: 34%
1: 0%	2: 0%	3: 3%	4: 14%	5: 34%	6: 34%
1: 0%	2: 3%	3: 0%	4: 17%	5: 21%	6: 45%
1: 3%	2: 31%	3: 31%	4: 7%	5: 10%	6: 3%
1: 0%	2: 45%	3: 10%	4: 14%	5: 14%	6: 3%
1: 0%	2: 0%	3: 3%	4: 17%	5: 38%	6: 28%
1: 0%	2: 0%	3: 0%	4: 10%	5: 41%	6: 34%
1: 0%	2: 0%	3: 3%	4: 14%	5: 34%	6: 34%
1: 69%	2: 17%				
1: 24%	2: 62%				
1: 0%	2: 86%				
1: 59%	2: 28%				

894		**GPA**	Category			
895	6	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category			
896	6.1	My GPA is...	Select one	25	2.0	0.93
134916		**student information**	Category			
134917	7	Please enter information below to help me interpret the survey results and improve the course	Category			
134918	7.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer	23		
134919	7.2	Please tell me which section of EvoEco you are in	Select one	25		0.46
145165		**Student investment**	Category			
145166	8	In an average week, how many hours did you spend on this class in the following areas. Feel free to elaborate with comments where appropriate.	Category			
145167	8.1	reading the book	Select one	25	4.1	1.05
145168	8.2	Reviewing your notes	Select one	25	4.0	0.96
145169	8.3	Watching course-related videos	Select one	25	4.9	0.76
145170	8.4	Studying for this class in other ways	Select one	25	4.8	0.88
145171	8.5	How much total time per week did you spend on this class (excluding time in class and studying for exams)?	Select one	25	5.1	0.70
145376		**Effort for this course**	Category			
145377	9	Compared to other Biology courses, rate this course in terms of the following areas	Category			
145379	9.1	Amount of critical thinking you had to do (i.e., versus memorization)	Select one	25	5.1	1.09
145380	9.2	Amount of assigned work	Select one	25	5.2	1.07
145381	9.3	How much effort you put in throughout the semester	Select one	25	5.1	1.19

1: 24%	2: 41%	3: 17%	4: 0%	5: 3%	
1: 62%	2: 24%				
1: 3%	2: 3%	3: 7%	4: 41%	5: 28%	6: 3%
1: 0%	2: 0%	3: 31%	4: 31%	5: 17%	6: 7%
1: 0%	2: 0%	3: 3%	4: 17%	5: 48%	6: 17%
1: 0%	2: 0%	3: 7%	4: 24%	5: 38%	6: 17%
1: 0%	2: 0%	3: 0%	4: 17%	5: 45%	6: 24%
1: 3%	2: 0%	3: 0%	4: 10%	5: 38%	6: 34%
1: 3%	2: 0%	3: 0%	4: 7%	5: 41%	6: 34%
1: 3%	2: 0%	3: 3%	4: 10%	5: 31%	6: 38%

145382	9.4	How much you learned	Select one	25	5.1	1.01
145383		**Course design and organization**	Category			
145384	10	Please comment on the overall effectiveness of the following course components. Where appropriate, include your thoughts on the usefulness of different assignments for accomplishing course goals (listed in syllabus)	Category			
145385	10.1	Focus on the interpretation of figures	Long answer	25		
145386	10.2	The use of pre-class videos (produced by others and by me) for delivering course content	Long answer	25		
145387	10.3	The peer editing process	Long answer	25		
145388	10.4	Summarizing a published paper in writing (recall that this is a WR course, so you may want to comment on whether you felt like this process improved your writing ability or not).	Long answer	25		
145389	10.5	Paper discussions (online and in class)	Long answer	25		
145390	10.6	Use of SimuText and other activities to explore class concepts	Long answer	25		
145391	10.7	Use of video and reading guides	Long answer	25		
145392	10.8	Quizzes as motivation for keeping up with reading	Long answer	25		
145393	10.9	The organization of the course Moodle page (both the layout of the home page and the use of topic-specific Moodle pages with learning objectives)	Long answer	25		
145394		**Additional feedback**	Category			
145395	11	Please comment freely on any other aspect of the course. Remember that I want to use these comments to improve the course, so the more detailed comments or suggestions you can offer the better.	Category			
145396	11.1	Here's a list of things to potentially comment on: the book (and how much you read it), the organization, difficulty level of exams, list of topics covered in class.	Long answer	21		

1: 3%	2: 0%	3: 0%	4: 3%	5: 52%	6: 28%

SALG - Student Assessment of their Learning Gains

Kate Hayden, ,
Instrument #71457, CH/BI308, Fall 2015
Administered Tue Sep 01, 2015 - Thu Sep 10, 2015

http://www.salgsite.org/

ID	Numl	Question	Type	Choices...	
826		**Understanding**	Category		
827	1	Presently, I understand...	Category		
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	1: not applicable	2: not at all
22435	1.2	How studying topics in this course help people address real world issues	Select one	1: not applicable	2: not at all
858		**Skills**	Category		
869	2	Presently, I can...	Category		
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	1: not applicable	2: not at all
865	2.2	Write documents in discipline-appropriate style and format	Select one	1: not applicable	2: not at all
866	2.3	Work effectively with others	Select one	1: not applicable	2: not at all
150037		**Critical Thinking Skills**	Category		
150038	3	Presently, I can...	Category		
150039	3.1	Separate factual information from inferences.	Select one	1: not applicable	2: not at all
150040	3.2	Interpret numerical relationships in graphs.	Select one	1: not applicable	2: not at all
150041	3.3	Understand the limitations of correlational data.	Select one	1: not applicable	2: not at all
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	1: not applicable	2: not at all
150043	3.5	Identify alternative interpretations for data or observations.	Select one	1: not applicable	2: not at all
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	1: not applicable	2: not at all
150045	3.7	Explain how new information can change a problem.	Select one	1: not applicable	2: not at all
150046	3.8	Separate relevant from irrelevant information.	Select one	1: not applicable	2: not at all
150047	3.9	Integrate information to solve problems.	Select one	1: not applicable	2: not at all
150048	3.10	Learn and apply new information.	Select one	1: not applicable	2: not at all

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	1: not applicable	2: not at all
150050	3.12	Communicate ideas effectively.	Select one	1: not applicable	2: not at all
870		**Attitudes**	Category		
871	4	Presently, I am...	Category		
150984	4.1	Enthusiastic about biochemistry.	Select one	1: not applicable	2: not at all
150985	4.2	Interested in taking or planning to take additional courses in biochemistry.	Select one	1: not applicable	2: not at all
150986	4.3	Confident that I understand biochemistry	Select one	1: not applicable	2: not at all
150987	4.4	Confident that I can perform well in future Biology and/or Chemistry courses	Select one	1: not applicable	2: not at all
877	4.5	Comfortable working with complex ideas	Select one	1: not applicable	2: not at all
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	1: not applicable	2: not at all
134909	4.7	intimidated by the prospect of speaking in class	Select one	1: not applicable	2: not at all
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	1: not applicable	2: not at all
880		**Integration of learning**	Category		
881	5	Presently, I am in the habit of...	Category		
883	5.1	Applying what I learn in classes to other situations	Select one	1: not applicable	2: not at all
884	5.2	Using systematic reasoning in my approach to problems	Select one	1: not applicable	2: not at all
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	1: not applicable	2: not at all
134910		**Major and goals**	Category		
888	6	What best characterizes your major in college?	Category		
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
891	6.3	Undecided at this time	Select one	1: Yes	2: No
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	1: Yes	2: No

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

894		**GPA**	Category		
895	7	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category		
150906	7.1	My GPA is... (please skip if you are a first-semester freshman)	Select one	1: 4.00-3.60	2: 3.01-3.59
134916		**student information**	Category		
134917	8	Please enter information below to help me interpret the survey results and improve the course	Category		
134918	8.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer		
150036	8.2	Please ignore this question.	Select one	1: Section A (9:30 AM)	2: Section B (12:30 PM)

3: 2.51-3.00	4: 2.01-2.50	5: 2.00 or lower	

ID	Numl	Question	Type	N	Mean	Std dev
826		**Understanding**	Category			
827	1	Presently, I understand...	Category			
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	22	4.9	0.75
22435	1.2	How studying topics in this course help people address real world issues	Select one	22	5.1	0.87
858		**Skills**	Category			
869	2	Presently, I can...	Category			
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	22	5.0	0.69
865	2.2	Write documents in discipline-appropriate style and format	Select one	22	4.8	0.81
866	2.3	Work effectively with others	Select one	22	5.0	0.82
150037		**Critical Thinking Skills**	Category			
150038	3	Presently, I can...	Category			
150039	3.1	Separate factual information from inferences.	Select one	22	4.8	0.81
150040	3.2	Interpret numerical relationships in graphs.	Select one	22	5.1	0.81
150041	3.3	Understand the limitations of correlational data.	Select one	22	5.0	0.87
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	22	4.6	0.91
150043	3.5	Identify alternative interpretations for data or observations.	Select one	22	4.6	0.96
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	22	4.5	0.67
150045	3.7	Explain how new information can change a problem.	Select one	22	4.7	0.84
150046	3.8	Separate relevant from irrelevant information.	Select one	22	4.8	0.87
150047	3.9	Integrate information to solve problems.	Select one	22	4.7	0.89
150048	3.10	Learn and apply new information.	Select one	22	4.8	0.92

Choices...					
1: 0%	2: 0%	3: 5%	4: 18%	5: 59%	6: 18%
1: 0%	2: 0%	3: 5%	4: 18%	5: 41%	6: 36%
1: 0%	2: 0%	3: 0%	4: 23%	5: 55%	6: 23%
1: 0%	2: 0%	3: 5%	4: 32%	5: 45%	6: 18%
1: 0%	2: 0%	3: 5%	4: 18%	5: 50%	6: 27%
1: 0%	2: 0%	3: 0%	4: 45%	5: 32%	6: 23%
1: 0%	2: 0%	3: 5%	4: 14%	5: 50%	6: 32%
1: 0%	2: 0%	3: 5%	4: 23%	5: 41%	6: 32%
1: 0%	2: 0%	3: 5%	4: 55%	5: 18%	6: 23%
1: 0%	2: 0%	3: 9%	4: 45%	5: 23%	6: 23%
1: 0%	2: 0%	3: 5%	4: 41%	5: 50%	6: 5%
1: 0%	2: 0%	3: 5%	4: 41%	5: 36%	6: 18%
1: 0%	2: 0%	3: 9%	4: 23%	5: 50%	6: 18%
1: 0%	2: 0%	3: 9%	4: 32%	5: 41%	6: 18%
1: 0%	2: 0%	3: 9%	4: 27%	5: 41%	6: 23%

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	22	4.4	1.05
150050	3.12	Communicate ideas effectively.	Select one	22	4.7	0.78
870		**Attitudes**	Category			
871	4	Presently, I am...	Category			
150984	4.1	Enthusiastic about biochemistry.	Select one	22	4.8	0.87
150985	4.2	Interested in taking or planning to take additional courses in biochemistry.	Select one	22	3.9	1.34
150986	4.3	Confident that I understand biochemistry	Select one	22	3.3	1.17
150987	4.4	Confident that I can perform well in future Biology and/or Chemistry courses	Select one	22	4.6	0.90
877	4.5	Comfortable working with complex ideas	Select one	22	4.3	0.94
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	22	5.0	0.84
134909	4.7	intimidated by the prospect of speaking in class	Select one	22	3.6	1.40
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	22	3.7	1.28
880		**Integration of learning**	Category			
881	5	Presently, I am in the habit of...	Category			
883	5.1	Applying what I learn in classes to other situations	Select one	22	4.4	0.79
884	5.2	Using systematic reasoning in my approach to problems	Select one	22	4.5	0.86
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	22	4.6	0.80
134910		**Major and goals**	Category			
888	6	What best characterizes your major in college?	Category			
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	22		0.00
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	22		0.21
891	6.3	Undecided at this time	Select one	22		0.00
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	22		0.21

1: 0%	2: 0%	3: 23%	4: 36%	5: 23%	6: 18%
1: 0%	2: 0%	3: 5%	4: 36%	5: 45%	6: 14%
1: 0%	2: 0%	3: 9%	4: 23%	5: 50%	6: 18%
1: 5%	2: 14%	3: 14%	4: 32%	5: 27%	6: 9%
1: 0%	2: 27%	3: 36%	4: 18%	5: 14%	6: 5%
1: 0%	2: 0%	3: 14%	4: 23%	5: 50%	6: 14%
1: 0%	2: 5%	3: 14%	4: 36%	5: 41%	6: 5%
1: 0%	2: 0%	3: 0%	4: 32%	5: 32%	6: 36%
1: 0%	2: 23%	3: 32%	4: 23%	5: 5%	6: 18%
1: 0%	2: 23%	3: 14%	4: 45%	5: 5%	6: 14%
1: 0%	2: 0%	3: 9%	4: 55%	5: 27%	6: 9%
1: 0%	2: 0%	3: 9%	4: 41%	5: 36%	6: 14%
1: 0%	2: 0%	3: 9%	4: 32%	5: 50%	6: 9%
1: 100%	2: 0%				
1: 5%	2: 95%				
1: 0%	2: 100%				
1: 95%	2: 5%				

894		**GPA**	Category			
895	7	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category			
150906	7.1	My GPA is... (please skip if you are a first-semester freshman)	Select one	22	1.6	0.58
134916		**student information**	Category			
134917	8	Please enter information below to help me interpret the survey results and improve the course	Category			
134918	8.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer	22		
150036	8.2	Please ignore this question.	Select one	22		0.46

1: 41%	2: 55%	3: 5%	4: 0%	5: 0%	
1: 73%	2: 27%				

SALG - Student Assessment of their Learning Gains

Kate Hayden, ,

Instrument #72178, CH/BI308, Fall 2015

Administered Tue Nov 24, 2015 - Thu Dec 03, 2015

http://www.salgsite.org/

ID	Numl	Question	Type	Choices...	
826		**Understanding**	Category		
827	1	Presently, I understand...	Category		
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	1: not applicable	2: not at all
22435	1.2	How studying topics in this course help people address real world issues	Select one	1: not applicable	2: not at all
858		**Skills**	Category		
869	2	Presently, I can...	Category		
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	1: not applicable	2: not at all
865	2.2	Write documents in discipline-appropriate style and format	Select one	1: not applicable	2: not at all
866	2.3	Work effectively with others	Select one	1: not applicable	2: not at all
150037		**Critical Thinking Skills**	Category		
150038	3	Presently, I can...	Category		
150039	3.1	Separate factual information from inferences.	Select one	1: not applicable	2: not at all
150040	3.2	Interpret numerical relationships in graphs.	Select one	1: not applicable	2: not at all
150041	3.3	Understand the limitations of correlational data.	Select one	1: not applicable	2: not at all
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	1: not applicable	2: not at all
150043	3.5	Identify alternative interpretations for data or observations.	Select one	1: not applicable	2: not at all
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	1: not applicable	2: not at all
150045	3.7	Explain how new information can change a problem.	Select one	1: not applicable	2: not at all
150046	3.8	Separate relevant from irrelevant information.	Select one	1: not applicable	2: not at all
150047	3.9	Integrate information to solve problems.	Select one	1: not applicable	2: not at all
150048	3.10	Learn and apply new information.	Select one	1: not applicable	2: not at all

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	1: not applicable	2: not at all
150050	3.12	Communicate ideas effectively.	Select one	1: not applicable	2: not at all
870		**Attitudes**	Category		
871	4	Presently, I am...	Category		
150984	4.1	Enthusiastic about biochemistry.	Select one	1: not applicable	2: not at all
150985	4.2	Interested in taking or planning to take additional courses in biochemistry.	Select one	1: not applicable	2: not at all
150986	4.3	Confident that I understand biochemistry	Select one	1: not applicable	2: not at all
150987	4.4	Confident that I can perform well in future Biology and/or Chemistry courses	Select one	1: not applicable	2: not at all
877	4.5	Comfortable working with complex ideas	Select one	1: not applicable	2: not at all
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	1: not applicable	2: not at all
134909	4.7	intimidated by the prospect of speaking in class	Select one	1: not applicable	2: not at all
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	1: not applicable	2: not at all
880		**Integration of learning**	Category		
881	5	Presently, I am in the habit of...	Category		
883	5.1	Applying what I learn in classes to other situations	Select one	1: not applicable	2: not at all
884	5.2	Using systematic reasoning in my approach to problems	Select one	1: not applicable	2: not at all
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	1: not applicable	2: not at all
134910		**Major and goals**	Category		
888	6	What best characterizes your major in college?	Category		
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	1: Yes	2: No
891	6.3	Undecided at this time	Select one	1: Yes	2: No
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	1: Yes	2: No

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

894		**GPA**	Category		
895	7	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category		
150906	7.1	My GPA is... (please skip if you are a first-semester freshman)	Select one	1: 4.00-3.60	2: 3.01-3.59
134916		**student information**	Category		
134917	8	Please enter information below to help me interpret the survey results and improve the course	Category		
134918	8.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer		
150036	8.2	Please ignore this question.	Select one	1: Section A (9:30 AM)	2: Section B (12:30 PM)
145165		**Student investment**	Category		
145166	9	In an average week, how many hours did you spend on this class in the following areas. Feel free to elaborate with comments where appropriate.	Category		
145167	9.1	reading the book	Select one	1: not applicable	2: not at all
145168	9.2	Reviewing your notes	Select one	1: not applicable	2: not at all
145169	9.3	Watching course-related videos	Select one	1: not applicable	2: not at all
145170	9.4	Studying for this class in other ways	Select one	1: not applicable	2: not at all
145171	9.5	How much total time per week did you spend on this class (excluding time in class and studying for exams)?	Select one	1: not applicable	2: not at all
145376		**Effort for this course**	Category		
145377	10	Compared to other Biology courses, rate this course in terms of the following areas	Category		
145379	10.1	Amount of critical thinking you had to do (i.e., versus memorization)	Select one	1: not applicable	2: not at all
145380	10.2	Amount of assigned work	Select one	1: not applicable	2: not at all

3: 2.51-3.00	4: 2.01-2.50	5: 2.00 or lower	
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

145381	10.3	How much effort you put in throughout the semester	Select one	1: not applicable	2: not at all
145382	10.4	How much you learned	Select one	1: not applicable	2: not at all
145394		**Additional feedback**	Category		
145395	11	Please comment freely on any other aspect of the course. Remember that I want to use these comments to improve the course, so the more detailed comments or suggestions you can offer the better.	Category		
145396	11.1	Here's a list of things to potentially comment on: the book (and how much you read it), the organization, difficulty level of exams, list of topics covered in class.	Long answer		

3: just a little	4: somewhat	5: a lot	6: a great deal
3: just a little	4: somewhat	5: a lot	6: a great deal

ID	Numl	Question	Type	N	Mean	Std dev
826		**Understanding**	Category			
827	1	Presently, I understand...	Category			
150669	1.1	The distinction between scientific ideas and non-scientific ideas	Select one	21	5.2	1.17
22435	1.2	How studying topics in this course help people address real world issues	Select one	21	5.7	0.58
858		**Skills**	Category			
869	2	Presently, I can...	Category			
860	2.1	Find articles relevant to a particular problem in professional journals or elsewhere	Select one	21	5.4	0.68
865	2.2	Write documents in discipline-appropriate style and format	Select one	21	5.0	0.55
866	2.3	Work effectively with others	Select one	21	5.4	0.68
150037		**Critical Thinking Skills**	Category			
150038	3	Presently, I can...	Category			
150039	3.1	Separate factual information from inferences.	Select one	21	5.0	0.74
150040	3.2	Interpret numerical relationships in graphs.	Select one	21	5.4	0.60
150041	3.3	Understand the limitations of correlational data.	Select one	21	5.2	0.87
150042	3.4	Evaluate evidence and identify inappropriate conclusions.	Select one	21	5.0	0.74
150043	3.5	Identify alternative interpretations for data or observations.	Select one	21	5.0	0.80
150044	3.6	Identify new information that might support or contradict a hypothesis.	Select one	21	5.2	0.68
150045	3.7	Explain how new information can change a problem.	Select one	21	5.2	0.68
150046	3.8	Separate relevant from irrelevant information.	Select one	21	5.2	0.77
150047	3.9	Integrate information to solve problems.	Select one	21	5.1	0.62
150048	3.10	Learn and apply new information.	Select one	21	5.2	0.60

Choices...					
1: 5%	2: 0%	3: 0%	4: 9%	5: 36%	6: 45%
1: 0%	2: 0%	3: 0%	4: 5%	5: 23%	6: 68%
1: 0%	2: 0%	3: 0%	4: 9%	5: 36%	6: 50%
1: 0%	2: 0%	3: 0%	4: 14%	5: 68%	6: 14%
1: 0%	2: 0%	3: 0%	4: 9%	5: 36%	6: 50%
1: 0%	2: 0%	3: 5%	4: 9%	5: 59%	6: 23%
1: 0%	2: 0%	3: 0%	4: 5%	5: 45%	6: 45%
1: 0%	2: 0%	3: 5%	4: 14%	5: 36%	6: 41%
1: 0%	2: 0%	3: 5%	4: 14%	5: 59%	6: 18%
1: 0%	2: 0%	3: 5%	4: 14%	5: 50%	6: 27%
1: 0%	2: 0%	3: 0%	4: 14%	5: 50%	6: 32%
1: 0%	2: 0%	3: 0%	4: 14%	5: 50%	6: 32%
1: 0%	2: 0%	3: 0%	4: 18%	5: 36%	6: 41%
1: 0%	2: 0%	3: 0%	4: 14%	5: 59%	6: 23%
1: 0%	2: 0%	3: 0%	4: 9%	5: 59%	6: 27%

150049	3.11	Use mathematical skills to solve real-world problems.	Select one	21	4.8	0.81
150050	3.12	Communicate ideas effectively.	Select one	21	5.0	0.67
870		**Attitudes**	Category			
871	4	Presently, I am...	Category			
150984	4.1	Enthusiastic about biochemistry.	Select one	21	4.7	0.97
150985	4.2	Interested in taking or planning to take additional courses in biochemistry.	Select one	21	3.9	1.35
150986	4.3	Confident that I understand biochemistry	Select one	21	4.4	0.92
150987	4.4	Confident that I can perform well in future Biology and/or Chemistry courses	Select one	21	5.0	0.92
877	4.5	Comfortable working with complex ideas	Select one	21	4.7	0.90
878	4.6	Willing to seek help from others (teacher, peers, TA) when working on academic problems	Select one	21	5.1	0.91
134909	4.7	intimidated by the prospect of speaking in class	Select one	21	3.0	1.00
134915	4.8	thinking that science is an accumulation of facts, rules, and formulas.	Select one	21	3.5	1.03
880		**Integration of learning**	Category			
881	5	Presently, I am in the habit of...	Category			
883	5.1	Applying what I learn in classes to other situations	Select one	21	4.7	0.78
884	5.2	Using systematic reasoning in my approach to problems	Select one	21	4.8	0.81
885	5.3	Using a critical approach to analyzing data and arguments in my daily life	Select one	21	4.8	0.81
134910		**Major and goals**	Category			
888	6	What best characterizes your major in college?	Category			
22445	6.1	Major is in the sciences (life, physical, etc.)	Select one	21		0.22
22446	6.2	Not a major in the sciences (life, physical, etc.)	Select one	21		0.00
891	6.3	Undecided at this time	Select one	21		0.00
134911	6.4	Planning on a career in a medical field (including PA, dentistry, veterinary, etc.)	Select one	21		0.30

1: 0%	2: 0%	3: 5%	4: 27%	5: 45%	6: 18%
1: 0%	2: 0%	3: 0%	4: 18%	5: 55%	6: 23%
1: 0%	2: 5%	3: 0%	4: 36%	5: 36%	6: 18%
1: 5%	2: 9%	3: 23%	4: 32%	5: 14%	6: 14%
1: 0%	2: 0%	3: 18%	4: 32%	5: 36%	6: 9%
1: 0%	2: 0%	3: 9%	4: 14%	5: 45%	6: 27%
1: 0%	2: 5%	3: 0%	4: 27%	5: 50%	6: 14%
1: 0%	2: 5%	3: 0%	4: 5%	5: 55%	6: 32%
1: 0%	2: 41%	3: 18%	4: 32%	5: 5%	6: 0%
1: 0%	2: 18%	3: 27%	4: 41%	5: 5%	6: 5%
1: 0%	2: 0%	3: 5%	4: 32%	5: 45%	6: 14%
1: 0%	2: 0%	3: 5%	4: 27%	5: 45%	6: 18%
1: 0%	2: 0%	3: 5%	4: 27%	5: 45%	6: 18%
1: 91%	2: 5%				
1: 0%	2: 95%				
1: 0%	2: 95%				
1: 86%	2: 9%				

894		**GPA**	Category			
895	7	What is your current GPA in a system that assumes a 4.00 as an A (highest score possible)?	Category			
150906	7.1	My GPA is... (please skip if you are a first-semester freshman)	Select one	21	1.7	0.64
134916		**student information**	Category			
134917	8	Please enter information below to help me interpret the survey results and improve the course	Category			
134918	8.1	Enter your student number here ((this will help me track your responses across all the times you take this survey)	Long answer	21		
150036	8.2	Please ignore this question.	Select one	21		0.40
145165		**Student investment**	Category			
145166	9	In an average week, how many hours did you spend on this class in the following areas. Feel free to elaborate with comments where appropriate.	Category			
145167	9.1	reading the book	Select one	21	3.3	1.15
145168	9.2	Reviewing your notes	Select one	21	4.2	1.18
145169	9.3	Watching course-related videos	Select one	21	5.1	0.77
145170	9.4	Studying for this class in other ways	Select one	21	4.3	1.32
145171	9.5	How much total time per week did you spend on this class (excluding time in class and studying for exams)?	Select one	21	4.9	0.89
145376		**Effort for this course**	Category			
145377	10	Compared to other Biology courses, rate this course in terms of the following areas	Category			
145379	10.1	Amount of critical thinking you had to do (i.e., versus memorization)	Select one	21	5.6	0.75
145380	10.2	Amount of assigned work	Select one	21	4.4	1.02

1: 36%	2: 50%	3: 9%	4: 0%	5: 0%	
1: 77%	2: 18%				
1: 5%	2: 14%	3: 45%	4: 18%	5: 9%	6: 5%
1: 0%	2: 5%	3: 27%	4: 18%	5: 32%	6: 14%
1: 0%	2: 0%	3: 5%	4: 9%	5: 55%	6: 27%
1: 5%	2: 0%	3: 18%	4: 32%	5: 18%	6: 23%
1: 0%	2: 0%	3: 5%	4: 27%	5: 36%	6: 27%
1: 0%	2: 0%	3: 5%	4: 0%	5: 27%	6: 64%
1: 0%	2: 0%	3: 18%	4: 41%	5: 18%	6: 18%

145381	10.3	How much effort you put in throughout the semester	Select one	21	5.3	0.85
145382	10.4	How much you learned	Select one	21	4.8	1.00
145394		**Additional feedback**	Category			
145395	11	Please comment freely on any other aspect of the course. Remember that I want to use these comments to improve the course, so the more detailed comments or suggestions you can offer the better.	Category			
145396	11.1	Here's a list of things to potentially comment on: the book (and how much you read it), the organization, difficulty level of exams, list of topics covered in class.	Long answer	16		

1: 0%	2: 0%	3: 5%	4: 9%	5: 36%	6: 45%
1: 0%	2: 5%	3: 5%	4: 18%	5: 50%	6: 18%