

**CSU Stanislaus BIOLOGY 1020-006: “World of Biology Laboratory”**  
Course Syllabus



**Labs: Wednesday 2:00-4:50 PM, 223 Naraghi Hall of Science**

**Instructor:** Jeremy Shuman

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**Office Hours:** M-W 1:00-2:00 PM or by appointment  
*\*schedule appointment at least 24 hours prior*

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**Required text:** “World of Biology 1020 Laboratory Workbook” 6<sup>th</sup> edition by Stevens and Fleming (2014).

*\* purchase from campus book store (no photocopies), and **bring to every lab***

**Additional resources;**

- The BIOL 1010 text, “Campbell Essential Biology” (4<sup>th</sup> edition or newer) by Eric J. Simon, Jane B. Reece, and Jean L. Dickey (2010 or newer)  
*\* “Mastering Biology Online” available with purchase of text*
- CSU Stanislaus tutoring center (112 Library Building). Services provided free of charge to CSU Stan students on a first come first serve basis
- Youtube.edu, search for biology topics
  - Deanna Beals’ World of Biology Video Series
  - Crash Course Biology
  - ASAP Science
  - Eyes of Nye

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If you do not have access to a personal computer, the CSU Stan computer labs are available. The one closest from our classroom is down the hall in N201.

**Announcements:** Check your CSU Stan email, and on the class BlackBoard site.

**Catalog Description:** (1 Unit) Basic laboratory and/or field studies in various biological areas. (Topics to be specified in Class Schedule) Satisfies laboratory requirement in natural sciences. Different topics can be taken for credit under this number, but may be taken only once for GE credit. Satisfies G. E. area B2. Prerequisites: BIOL 1010 or concurrent enrollment. (Laboratory, 3 hours) (Fall, Spring).

**Course Description:** The course is intended to provide students with laboratory experience in various biological contexts, mostly related to concepts covered in BIOL 1010. Note that while this lab does parallel BIOL 1010 closely, it is taken and graded separately from BIOL 1010.

**Course Objectives:** After completing this course you should be able to;

- (1) Demonstrate your ability to think like a biologist.
- (2) Speak/write coherently about biology with biologists and non-biologists alike.
- (3) Use biological knowledge to make informed decisions in your life.

**Participation in Classroom Design Study:** Your instructor has volunteered involvement of this class in a study that is researching the efficacy of different classroom designs and teaching styles. Your instructor will be following specific protocols that have been approved by the CSU Stanislaus Institutional Review Board. Every student in this class will be instructed following the same methodology regardless of participation, but your individual involvement with this study is voluntary and not required for completing this course. If you choose to participate in the study, all personal identifying information will be removed. Choosing involvement with this study is an exciting opportunity to engage in “real-life” scientific research that encompasses several goals, including improvement the learning experience for students just like you.

**My Teaching Philosophy:** I will present an interactive learning experience and provide patient guidance. I will focus on not only teaching the subject matter, but also *how* I teach you. While the answer a student gives is important, I value the process that the student goes through to reason out the answer. I recognize that everyone thinks and learns differently, but also that everyone has unique experiences and expertise that they can volunteer, which strengthens the entire class as a whole. I will focus on helping develop your critical thinking skills and “street smarts” for using science in your every-day affairs, as well as prepare your professional skills for your academic endeavors and your career path. As an instructor of this class I act as a catalyst for your learning, meaning I will help you with challenges by guiding you as you develop solutions, but I will only rarely give you answers directly. As a student it is your responsibility to engage with your classmates and the material. Your participation in the class is paramount to the quality of learning you will foster.

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### **How to be a successful student in this class:**

#### Before lab:

- Complete homework assignment(s), proof-read for errors, staple multiple pages
- Read through your lab workbook and take notes on upcoming lab
- \*HINT! quiz questions are based off of lab workbook content*
- Use additional resources to get a good understanding of the upcoming topic
- Check for any announcements

#### Bring to lab:

- Your 1 page (front and back) notes to use for the quiz** and during class
- Assignment(s) due
- Lab notebook
- Phone calculator or standard calculator

#### During lab:

- Show up on time
- Turn in assignments due at the beginning of class (e-mailed assignments are not accepted), and check for hand-outs
- Ask questions and share your comments, ideas and opinions
- Take notes
- Do not disrupt the rights, property, or learning environment of others. Act in the interest of others and help create and maintain an environment that is comfortable and conducive to learning

#### After lab:

- Clean up your area, or other obvious messes
- If you see someone else who has fallen behind or is confused, help them!

\* \* \*

**Evolution:** “Respect for data, comfort in faith.” Evolution and natural selection are central tenets of biology and will be critical aspects of this course, openly discussed and referred to frequently.

**Math:** We will be using simple statistics such as calculating averages and variances, as well as making and interpreting graphs.

*\*A calculator and skills in using Microsoft Excel will help you. If you have not used Excel for calculating and analyzing data, including plotting graphs, search for tutorial you-tube videos to get a better understanding*

**Lab Policies:** (1) Safety, (2) Teamwork, (3) Data.

**Safety:** Please demonstrate proper care for and use of lab materials and supplies. A safe lab is a productive lab. Please report any injuries, spills, broken equipment, or any other safety concerns to the instructor immediately. If you see something (or hear, smell, feel...) say something! *Trust your gut instinct!*

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- *NO food or drink (not even water!) in the lab because of the possibility of contamination with lab materials. You can store your food and water outside in the hallway.*
- *Because labs are contaminated places, it is smart to clean your workspace, and to wash your hands (and elbows) before you leave. Consider that animal dissections are frequently performed on lab benches!*
- *Wear closed-toed shoes and protective clothing – we will be working with glass, fire, sharp instruments, and chemicals. Do not wear your favorite designer wears, consider that we will be working with stains.*
- *When working away from your desk, push your chair in (with arm rests raised up) to prevent tripping hazards and cluttered aisles*
- *Store your belongings under your desk, not on top of table (contamination hazard), or on the floor (tripping hazard)*
- *When working with an open flame, secure long hair by tying it in a pony tail*
- *If there is broken glass, do not try and clean it up all by yourself. Alert the instructor and the rest of the class to avoid the area where glass shards may be.*

**As per university regulations, students who fail to complete the safety quiz with a perfect score, or who miss the first lab without notifying the instructor within a reasonable amount of time, or are habitually late/absent will be dropped from the course.**

**Teamwork:** Like any lab course, this one requires your active participation each week, frequently with your lab partner(s), and with the class as a whole. Your lab partners depend on you (and you depend on them) for working through each lab. This includes proper set up of experiments, data collection, and thoughtful interpretation of results. When working in groups it is encouraged to share ideas, but **each student is required to do their own work (make their own interpretations), and turn in their own work.** You do not always have to have the same lab partner, but you cannot habitually work by yourself.

**Cell Phones and other internet enabled devices:** Cell phones, tablets, laptops, etc. are allowed to be used during class time, but **ONLY** for educational purposes such as using your calculator app, accessing notes, or searching the web to help answer a question from the lab. ***Cell phone and other Internet enabled device use is not permitted during assessments such as quizzes.***

**Special Accommodations:** This course is Americans with Disabilities Act (ADA) accessible.

Students with documented disabilities should seek special accommodations for all classes through the Disability Resource Services (DRS) office on campus (2<sup>nd</sup> floor MSR building). If DRS notifies the instructor that you require ADA accommodations, then the instructor will provide those accommodations (such as video/audio recording, hiring a note-taker, extended test time etc.).

*\* If you record this lab in any form (video/audio/photo etc.) without permission or without accommodation from DRS, that constitutes intellectual property theft*

**Student Athletes:** Your coach should contact the instructor if you are going to miss lab for games/matches ASAP. I will accommodate your schedule by allowing alternate lab dates if possible, otherwise I will provide an alternative assignment to excuse missed points.

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***If you know you are going to miss a lab and want to make it up, notify the instructor AT LEAST 2 weeks prior so that accommodations can be made.***

\* \* \*

**Absences:** *It is extremely unlikely to make up missed labs. Unexcused absences always result in zero points. Absences may be excused under dire circumstances/emergencies if a hard-copy (no-email), signed documentation of hardship is provided (such as a sick note from campus health center).*

**Cheating and Plagiarism:** Your work should reflect your own ideas, efforts, and words. *Cheating in any form is inappropriate conduct and will be dealt with swiftly and severely according to Sections 41301-41304 of Title 5 of the "California Code of Regulations" which includes expulsion, suspension or probation.*

More information regarding what constitutes plagiarism can be found at;  
[www.library.csustan.edu/gorenstein/helpguides/plagiarism.htm](http://www.library.csustan.edu/gorenstein/helpguides/plagiarism.htm)

*\*HINT! "sharing" your graphs is considered cheating! Make your own graph, even if you have the same data as everyone else*

\* \* \*

### **Important Date:**

Feb 23<sup>rd</sup> – Last day to add or drop the course *and* Last day to change your grading option with my signature. I strictly adhere to the grading option Academic Records has on file for you when I submit final grades. I will not change grades once final grades have been submitted.

**Grading:** All homework, quizzes, and extra credit assignments will be graded and returned to you the following lab period, or ASAP.

You must fill out everything (possible) in ALL chapters of your lab book, be neat, and be thorough. You can keep your lab book during the semester because you will need to study from it, but the instructor will be grading you during class on the completion of your lab book.

**"Co-instructor" Assignment:** As part of your participation points, you will act as a co-instructor for one of the labs. This includes coming prepared to lead the class in a discussion on the day's topic, as well as helping instruct the lab. Details on your responsibilities as a co-instructor will be posted on BlackBoard in the "Assignments" folder.

*\* The final exam for this lab is optional!* It will be comprehensive and structured similar to lab quizzes. The final exam **MUST** be taken during the scheduled time, there will be no make-up finals.

Grades are based on homework assignments, participation, and the optional final exam. A handful of extra credit points will be available. Assignments are graded based on completely answering all

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questions, data collection, and careful presentation of graphs and diagrams. We review assignments in class and you will have an opportunity to ask questions.

***Late work will not be accepted except in dire circumstances/emergencies, and then you must provide documentation of hardship. All submitted work must be original and turned in during lab; photocopies or scans (e-mail) are not acceptable.***

### Assignments and Points Available:

**A = 90 or above    B = 80-89    C = 70-79    D = 60-69    F= 59 or below**

*No +/- will be applied to your final grade!*

Week #	Required Assignment	Points	Optional Extra Credit	Points
1	Class scientist ID card (exercise in identifying yourself as a scientist)	20	<i>Pseudoscience quiz</i>	10
2	Cells, Microscopes, and Measurements quiz	30		
	Cells, Microscopes, and Measurements lab questions	30		
3	Scientific Method quiz	30		
	Daphnia scientific paper	60		
4	Cell Transport quiz	30		
	Cell Transport lab questions	30		
	Daphnia paper peer-review	50		
5	Cell Metabolism quiz	30		
	Cell Metabolism lab questions and graphs	40		
6	Mitosis quiz	30	<i>Mitosis, cancer and chemotherapy research paper</i>	10
	Mitosis lab questions	30		
7	Meiosis and Genetics quiz	30	<i>Genetic disease and heredity research paper</i>	10
	Meiosis and Genetics lab questions	30		
8	Phylogenetic Tree quiz	30		
	Phylogenetic Tree lab questions and trilobite tree figure	40		
9	Evolution quiz	30		
	Evolution lab questions and graphs	40		
10	Plant Adaptation quiz	30	<i>Genetic Modification vs. Genetic Engineering research paper</i>	10
	Plant adaptations lab questions	30		
11	Animal adaptations quiz	30		
	Animal adaptations lab questions	30		
12	Population and growth curves quiz	30		
	Population and growth curves lab questions and graphs	40		
13	Ecology quiz	30		
	Ecology lab questions (including video)	40		

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	questions) and graphs			
1-13	Co-instruction participation	50		
1-13	Attendance and participation	30		
1-13	Lab workbook completion	50		
14	<i>Optional Final Exam</i>	60		
	<b>TOTAL POINTS</b> <b>WITH OPTIONAL FINAL EXAM</b>	<b>1000</b> <b>1060</b>	<b>EXTRA CREDIT</b>	<b>40</b>

### Tentative Lab and Assignment Schedule:

Date	Topic/Activity	To do to prepare for class; * unless otherwise noted, links to videos and PDF files available on Blackboard in the "Assignments" folder * all typed papers in 12 pt. font, double spaced * to prepare for your co-instructor day, see list of responsibilities posted on Blackboard
1/28	Attendance, syllabus, intro to critical thinking (pseudoscience and logical fallacies)	<ol style="list-style-type: none"> <li>1) Print out the "Class Scientist ID Card", complete, and bring to class prepared to introduce yourself and your card to the class</li> <li>2) <i>Print out the "Pseudoscience Quiz" extra credit, complete, and bring to class</i></li> </ol>
2/4	Cells, microscopes, and measurements	<ol style="list-style-type: none"> <li>1) Read and take notes on the "Cells, Microscopes, and Measurements" chapter in your lab book (pgs. 11-25)</li> <li>2) Make a note page to use during the microscopes quiz</li> </ol>
2/11	Scientific method, daphnia experiment	<ol style="list-style-type: none"> <li>1) Type up answers to lab book study questions (pg. 25) and bring to class</li> <li>2) Read and take notes on the "Scientific Method and Hypothesis Testing: Daphnia on Drugs" chapter in your lab book (pgs. 1-10) <b>Be sure to complete the pre-lab sections!</b></li> <li>3) Make a note page to use during the scientific method quiz</li> </ol>
2/18	Cell transport	<ol style="list-style-type: none"> <li>1) Type up research paper with your results from the Daphnia experiment (follow formatting provided in the "Daphnia grading rubric") and <b>bring TWO copies to class, one to turn in to be graded, and one to have peer-reviewed</b></li> <li>2) Read and take notes on the "Transport" chapter in your</li> </ol>

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lab book (pgs. 27-37)

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|------|--|--|
|      |  | 3) Make a note page to use during the transport quiz   |
| 2/25 | Cell metabolism  | 1) Peer-review a classmates Daphnia paper, writing your comments and ideas on the paper, and bring to class<br>2) Type up answers to lab book study questions (pgs. 36&37) and bring to class<br>3) Read and take notes on the "Metabolism" chapter in your lab book (pgs. 39-48)<br>4) Make a note page to use during the metabolism quiz |
| 3/4  | Cell cycle and mitosis                                 | 1) Complete metabolism graphs, print, and bring to class<br>2) Read and take notes on the "Cell Cycle and Mitosis" chapter in your lab book (pgs. 49-55)<br>3) Make a note page to use during the mitosis quiz   |
| 3/11 | Meiosis and genetics                                   | 1) <i>Type up and bring to class extra credit research paper on a specific type of cancer, how mitosis is involved, and how chemotherapy is involved with mitotic division</i><br>2) Read and take notes on the "Genetics" chapter in your lab book (pgs. 57-72)<br>3) Make a page of notes to use during the meiosis quiz                 |
| 3/18 | Phylogenetic trees                                     | 1) <i>Type up and bring to class extra credit research paper on a specific genetic disease and how meiosis is involved in the heredity of the disease</i><br>2) Read and take notes on the "Inferring and Understanding Phylogenies" chapter in your lab book (pgs. 73-79)<br>3) Make a page of notes to use during the phylogenetics quiz |
| 3/25 | Evolution<br><i>*outdoor lab,<br/>bring calculator</i> | 1) Type up answers to lab book study questions (pg. 78), <b>print out a picture or include a sketch of your trilobite tree</b> , and bring to class<br>2) Read and take notes on the "Evolution" chapter in your lab book (pgs. 79-88)<br>3) Make a page of notes to use during the evolution quiz   |
| 4/1  | <b>March 31<sup>st</sup> Cesar</b>                     | <b>NO LABS THIS WEEK</b>   |

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### Chavez Day

4/8	Spring Break	<b>NO LABS THIS WEEK</b>
4/15	Plant adaptations	<ol style="list-style-type: none"><li>1) Type up answers to lab book study questions (pg. 87) and complete evolution graphs, print out, and bring to class</li><li>2) Read and take notes on the "Plant Biology" chapter in your lab book (pgs. 89-101)</li><li>3) Make a page of notes to use during the plants quiz</li></ol>
4/22	Animal adaptations	<ol style="list-style-type: none"><li>1) <i>Type up and bring to class extra credit research paper on the differences between GM (Genetic Modification) such as selective breeding, hybridization, and mutagenesis, and GE (Genetic Engineering) for transgenic organisms. BEWARE the media often says "GMO" when referring to GE organisms. <b>LOOK OUT FOR PSEUDOSCIENCE!</b></i></li><li>2) Type up answers to lab book study questions (pgs. 100&amp;101) and bring to class</li><li>3) Read and take notes on the "Animal Adaptations" chapter in your lab book (pgs. 103-113)</li><li>4) Make a page of notes to use during the animals quiz</li></ol>
4/29	Population parameters	<ol style="list-style-type: none"><li>1) Type up answers to lab book study questions (pgs. 111-113)</li><li>2) Read and take notes on the "Population Parameters" chapter in your lab book (pgs. 115-128)</li><li>3) Make a page of notes to use during the populations quiz</li></ol>
5/6	Central CA ecology	<ol style="list-style-type: none"><li>1) Type up answers to lab book study questions (pgs. 126&amp;127) and make graphs, print out, and bring to class</li><li>2) Read and take notes on the "Ecological Methods and Central Valley Ecology" chapter in your lab book (pgs. 129-140)</li><li>3) Make a page of notes to use during the ecology quiz</li></ol>
5/13	Optional Final Exam	<ol style="list-style-type: none"><li>1) Type up answers to lab book study questions (pg 140) and make ecology graphs, print out, and bring to class</li></ol>

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- 2) *Study for the final by reviewing your past quizzes. Make a page of notes to use during the exam.*