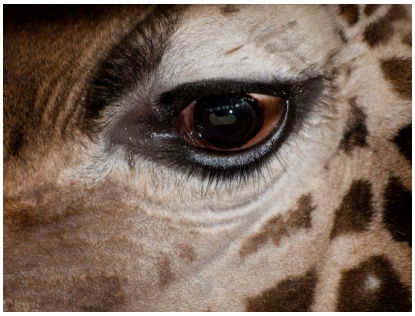
Bio21: Principles of Biology – Organismal

Los Medanos College – Spring 2015



"Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime."
- Chinese proverb

Instructor: Briana McCarthy
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Office Phone: (925) 473 – 7779

Class Schedule: Tu/Th: 8:00 – 9:20am (Lecture)
Tu/Th: 9:40am – 12:20pm (Lab)

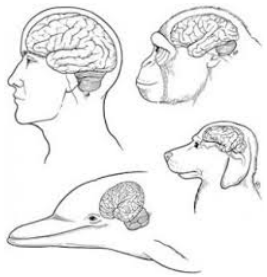
Class Location: SCI 131 (Lecture); SCI 130 (Lab)

Office Hours: Tues 2:30-4pm (SCI 115), Wed 12-1:15pm (SCI 115), Thurs 2:30-4pm (SCI 115), & Fri 12-12:45pm (SCI 115), or by appointment

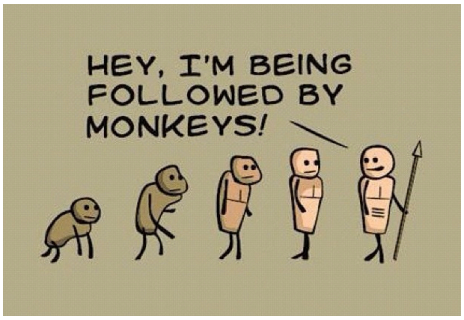
Course Website: https://desire2learn.4cd.edu/(Desire2Learn)

Course Credit: 5.0 Units, UC/CSU transferable as general education area B2, B3

Course Pre-reqs: Math 029 or 030 & Bio20



Syllabus Table of Contents:



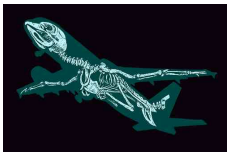
I. Course Overview and Learning Objectives

What Do I Need to Know about the Course?

First of all, welcome to Bio21! I am so excited to begin the semester with some old and some new faces. This course is the second in the sequence of courses designed and taught for biology majors. Together, Bio20 and 21 provide the fundamental content for students beginning their studies as biology majors. Bio21 will prepare students for upper division biology courses in evolution, ecology, zoology, anatomy and physiology. Some of the major topics covered are evolution of life forms and organ systems, the taxonomy and defining characteristics of the major plant and animal phyla in an evolutionary context, and an introduction to ecology.

What Will I Accomplish as a Learner by the End of This Course?

Below are the student learning outcomes for this course. By the end of the semester, students should be able to:



- Apply various biological classification schemes to distinguish between closely and not-so closely related life forms and identify the similarities and differences among these major organismal groups by recognizing, both microscopically and macroscopically, the structures used by different life forms in their efforts to sustain life and correlate these structures with their functions.
- Given a set of experiments formulate a scientific hypothesis, work collaboratively to collect, analyze and report the data both in prose and graphically.
- Describe mechanisms of evolutionary processes and how they give rise to the unity and diversity of life and considering the unity and diversity of life on Earth, evaluate the interdependence of various life forms and their interactions with the environment leading to ecological and evolutionary implications.

What Will We Be Doing in Class to Achieve These Learning Outcomes?

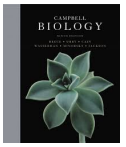
Our classroom culture will be one that emphasizes **"doing biology,"** meaning that we will work cooperatively in teams in order to achieve our learning goals. Paired discussions, small group work, lab explorations, lecture, practical exams, self-assessment, reflections, article analyses, and case studies will all be utilized to engage in scientific inquiry and critical thought. Science is often done by teams working together; we will practice this as much as possible in and out of class together.

II. Required & Recommended Course Materials

What Materials Do I Absolutely Need?

- **Lab Manual:** Bio 21 Custom Manual. McGraw Hill Create. *Available in the bookstore/on reserve in library for copying.*
- **Index Cards:** One pack of 3x5 index cards (lined or unlined) to be used in lecture and lab.
- **Access to Computer/LMC Email:** D2L will be used to submit select class assignments (access using your Insite user name and password). You must also regularly check your LMC email (2x/week recommended), or set up mail forwarding to an account you check regularly, as your LMC email is the default used by Insite.

What Materials/Resources Are Recommended?



- Textbook: Campbell Biology. Reece, et al. 9th ed. *Available in the bookstore/copies on reserve at the library.*
- Tutoring & STEM support: Center for Academic Support (3rd floor of Core Bldg / 925-473-7590) & MESA Center (SC202 / 925-473-7683) – provides free tutoring (for Bio21 and other classes)
- Regular academic counseling: Counseling Services (Student Services Bldg – Rm 400) offers appointments with counselors to make educational plans, prepare for transfer, plan for career, etc. You can make an appt by calling (925-473-7449) or visiting http://www.losmedanos.edu/counseling/
- The Transfer Academy, Honors Program, Puente, Academy for College Excellence (ACE) and Umoja are also excellent student programs to use: http://www.losmedanos.edu/learningcommunities/

III. Grade Breakdown & Course Components

How Will I Be Graded?

I hope that you will primarily focus on **learning objectives** and developing the **habits of mind of a critically thinking scientist**. This course is thoughtfully designed to promote your learning. I will use graded assignments and tests outlined below specifically to facilitate your understanding of the topics and believe that your grade will be representative of your progress in this class. The points below are subject to change, depending on where the learning journey takes us!

Points	Percent	Description
325	(43%)	Lecture Exams (2 midterms @ 100 points each, 1 comprehensive final @ 125 points)
100	(14%)	Lab Practicals (2 @ 50 points each)
80	(11%)	Lecture Activities and Participation (index cards, article analyses, etc)
70	(9%)	Lab Worksheets and Activities
70	(9%)	Reflections (3 @ 15 pts each + Final Reflection @ 25 points)
70	(9%)	Ecology Research Project
35	(5%)	Class Project

Total = 750 points. Grade assignments will be based on the percentage of total points earned

A = 90 – 100% of total points **B** = 80 – 89.9% **C** = 70 – 79.9% **D** = 60 – 69.9% **F** = < 60%

Will There Be Extra Credit Available?

There will be 5-10 extra credit points available on all exams for answering questions about your progress as a learner in this course and providing feedback to me on the course structure.

What Will Lecture Exams and Lab Practicals Be Like?

As far as lecture goes, there will be **2 midterm tests** and **1 final exam** based on material we discuss in lecture. See the course calendar for the timing of these tests. The tests will include a variety of question styles that require you to recall, evaluate, apply, and reflect on what you have learned. Index cards will provide us a way to practice such questions and review material as we learn it. I will also give you a **study guide** a week before each test. Because it is time-consuming and difficult to give make-up exams, there are no make-up lecture exams offered unless you have a documented emergency, so please look at exam dates now and plan ahead. If you do have an emergency, leave a message on my office phone AND email me as soon as you are able to. I will reschedule the exam with you once you have shown documentation (car accident report, hospital note, etc).

Additionally, there will be **2 lab practicals**, which will require you to recall concepts from lab and demonstrate skills you have learned throughout the semester. You will also receive **study guides** for these exams. Similarly to lecture exams, there will be no make-ups offered unless you have a documented emergency.

In coordination with the DSPS office, reasonable accommodation will be provided for eligible students with disabilities. Please contact the DSPS office at (925-473-7471) or visit in person (Student Services Rm 321) & find out more on their website: http://www.losmedanos.edu/nav/services.asp.

What Exactly Are Lecture Activities? How Will Participation Be Measured?

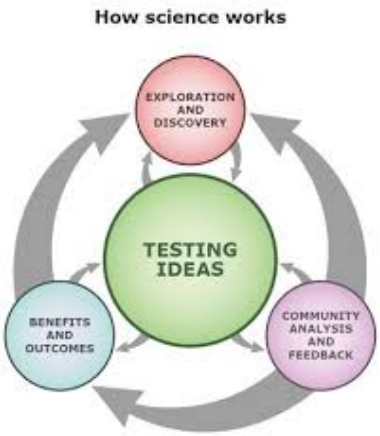
Because participation in lecture means not just being physically present, but intellectually present as well, it is important that I hear from you as an individual and that you also have opportunities to work with your peers. Learning from and sharing ideas with those around you is essential for success in this class and beyond! Thus, I will provide you with numerous opportunities to share your ideas in class – through **index cards, large team work, small group work, mini presentations**, and other activities, all of which are designed to more deeply engage you in the material and help you make it meaningful to you.

One way I will hold you accountable for lecture participation is through the use of **index cards**. During lecture, I will present you with a question/statement that challenges your scientific and/or personal viewpoints. After discussing the problem with your peers, I will ask you to provide an *independent* response on a note card and turn it in. I will mark your response using the following system:

- **Pink** – Complete response. Well supported with biological evidence. **5 points**
- **Blue –** Partially complete response. On-topic, but need some more evidence. Please revise! **3 points**
- **Green** – Incomplete response. Off topic or lacking evidence. Please revise! **1 point**

If you receive a **green** or **blue** mark, please talk over the question with your classmates and/or with me, revise your response, and turn in your revised index card to the back pocket of the index card holder to receive up to **4 points.** You may either revise your response directly on your original card or on a new card. I hope these index cards a) allow you a chance to think through your ideas, b) take the pressure off the formal testing process by accounting for a portion of your grade, and c) provide me with an idea of your understanding of the concepts we cover in class. If you are absent for an index card or lecture activity, you may not make it up, so please make sure you attend class!

What Will Happen in Labs?



In lab, you will be working through **experiments** and **lab stations** with a team of your peers. In all lab sessions, you will **work as a group**, and your group may change every so often, which means you must learn to collaborate with a variety of individuals – a very practical life and career skill. No matter which career you enter into, you will be required to work with a diversity of people. Rotating through groups in lab is great practice for this, and allows me to evaluate you on teamwork (which may come in handy if asked to do so in a letter of recommendation). Your goal is to model the work of science professionals – reviewing one another's work, providing feedback and support, working towards common objectives, and sharing ideas, frustrations, and tribulations along the way.

In lab, you will be honing your **skills as a scientist** through engaging in mostly hands-on biology investigations. Because every lab will be a different experience, I highly recommend keeping a running list of all the skills and techniques you learn throughout the semester (compound light microscopy, gel electrophoresis, vertebrate dissection, etc); these may come in handy in the future during school or job interviews!

Three or four labs will require **write-ups** and/or **worksheets** to be turned in within a week of completing the lab. These may be turned in no more than a week late.

Do I Need to Attend *Every* Lecture and Lab?

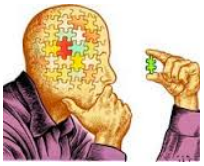
Absolutely! **Attendance of lecture and lab is *essential* for success**. If you're late and/or absent, you will lose points by missing in-class activities and index cards; plus, questions and problems discussed in lecture & lab appear

on the tests. Not to mention, you'll be missing fun activities and discussions - vital parts of the learning experience.

Please plan to sign yourself in at the beginning of each lecture and lab so that I can track your progress in the class (please don't sign anyone else in – this is not the point of the record of attendance, as it is not used to assign points). Students not in attendance on the first day of class will be dropped, and students who miss more than 2 consecutive weeks of lecture and/or lab will be dropped. You must be enrolled in the class to attend; the college does not permit sitting in or auditing a class.

What are Reflections?

In order to turn knowledge into something you can use, it is important to reflect on what you know and what concepts are still confusing to you. Several times during this course you will be required to submit **Reflections** to me and/or your classmates via D2L (see schedule for due dates). I will provide prompts for you to respond to. You should spend approximately **40 mins** considering the prompt and responding in writing. These reflections are not meant to be formal essays, or finely polished documents for public view. They should show your own ideas and thought processes, and should be as much for your own benefit as mine. Grades will be assigned for turning them in on time and writing thoughtfully and on topic. Reflections will not be accepted more than 1 week late and will be given partial credit after the due date.



What are the Class Project and Ecology Research Project?

The **Class Project** is a student-driven project that will involve collaboration with the rest of the class to communicate a key science concept to the broader public. We are currently looking into an opportunity for students to present a science demonstration at Los Medanos College's 40th anniversary Open House. The **Ecology Research Project** will provide an opportunity to practice working with a small group of your peers to engage in scientific research that is meaningful to you. With the guidance of me and your classmates, you will be choosing a research question, designing an experiment, and collecting data throughout the semester. More information on these two exciting projects will be provided in class and posted to D2L in the first few weeks of the semester.

IV. Role of Instructor & Factors for Success in Bio21

What is the Role of the Instructor in this Class?

I am here to guide you through activities and dilemmas that are meant to help you develop a deeper understanding of the function and structure of life. I am not here to give you all the answers (most of the time, there are no fixed, "right" answers to most scientific problems anyway, and if there are, I oftentimes don't have them!) Think of me as your "guide on the side" – fostering the class learning community and helping you to think critically and develop as scientists. I truly do strive to utilize your conceptions and ideas to enhance the overall learning experience, and I welcome ideas and feedback you have around this. Please come visit me in office hours anytime for help or to share your experiences as a learner in this class. I am a learner, too, and am constantly looking for ways to improve my teaching practice and the class in order to set students up for even greater success.

In the case that I am unexpectedly late to or absent from class, please check D2L site for announcements, refer to any potential class cancellation notice on the main LMC webpage (http://losmedanos.edu/classcancel/), and leave after waiting for 20 minutes beyond class start time. Continue to check D2L for correspondence.

What Do I Need to Do to Succeed in this Course?

- Be open to learning in different ways.
- Take initiative for developing and honing your skills as a scientist and learner.
- Use respectful language and professionalism in your interactions with others.
- Show respect for your instructor & classmates with different learning preferences or viewpoints.
- Network with others in the class, be a supportive colleague, and form connections.
- Come to class early and review notes with classmates/on your own prior to lecture starting; review notes/slides before/after class to clarify information and broaden knowledge.

- Be prepared for all labs you will complete. Understanding the learning goals of labs ahead of time will help you get the most out of your experience.
- Log in to D2L at least 2x/week to view course announcements, assignments, grades, and correspondence.
- Revise your index cards when you do not receive a pink the first time around.
- Take responsibility for your own learning by staying attentive and organized. Utilize all learning resources – **textbook readings, D2L, free on-campus tutoring, textbook resources** (http://www.masteringbio.com/), **office hours**, and **study groups.**
- Clean up after yourself, respect equipment and supplies, and report spills/damages as soon as they occur.
- Please don't eat or drink in lecture or lab. LMC policy is no food/drink in classrooms or laboratories. Drinking water, of course, is expected and encouraged! Keep those cells turgid.
- Do not text or make calls during class. Step out to use your phone in case of emergency. Use your computer respectfully – you won't want to miss a moment in class!
- Approach me for help often and let me know how things are going.
- Have fun! There are worse places to be than in a science classroom full of people who are committed to academic and professional success.

V. Student Support Services on Campus

How Can I Obtain Accommodations for a Documented Disability or Alter-ability?

Students with documented disabilities or alter-abilities may request accommodations for this course at the beginning of the semester. Every effort will be made by the instructor to accommodate students if notification is received early in the semester, or as soon as possible following any situation that arises during the semester. To receive support from a specialist regarding accommodations, please contact Disabled Student Programs and Services (DSPS) by phone (925-473-7471) or visit in person (Student Services Rm 321) & find out more on their website: http://www.losmedanos.edu/nav/services.asp.

VI. Policy on Academic Integrity

What Do I Need to Know about Academic Integrity?

Students are expected to maintain academic integrity in all work pursued at LMC. Cheating or plagiarism will not be tolerated in this course. These acts will result in failure on the assignment during which they occurred and disciplinary action according to LMC policy. Use of any electronic device during an exam will be considered cheating, and for this reason, I cannot allow you to step out during an exam, unless it is an emergency. We all have a responsibility to be honest, and I trust that you will be. The LMC Code of Conduct can be found here: http://www.losmedanos.edu/nav/services.asp.

> From the student Code of Conduct, page 2: (CCCCD Student Services Procedure 3027)
> *"Acts of academic dishonesty, including, but not limited to, cheating, tampering, fabrication, plagiarism, or assisting others in an act of academic dishonesty. Cheating is defined as unauthorized copying or collaboration on a test or assignment, or the use or attempted use of unauthorized materials. Tampering is defined as altering or interfering with evaluation instruments or documents. Fabrication is defined as falsifying experimental data or results, inventing research or laboratory data or results for work not done, or falsely claiming sources not used. Plagiarism is defined as representing someone else's words, idea, artistry, or data as ones' own, including copying another person's work (including published and unpublished material, and material from the internet) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project, then submitting it as one's own. Assisting is defined as assisting another person in an act of academic dishonesty, such as taking a test or doing an assignment for someone else, changing someone's grades or academic records, or inappropriately distributing exams to other students."*

VI. Course Schedule

Please see next page for course schedule

Biology 21 Lecture and Lab Schedule (Subject to Change)

Dates	Lecture Topics & Recommended Campbell Reading Pages	Lab Topic and Manual Pages * = *Labs with Worksheets Due*	Assignments DUE
Week 1: Jan 13/15	Intro to Class / How Do We Organize Life & Measure Diversity? p.536-542, 551-552,1144-5	Lab Introduction Measuring Biodiversity (p. 6-8)	**Sun, 1/18:** Syllabus Quiz, All About You
Week 2: Jan 20/22	What Exactly Is an Eye? / Are All Eyes the Same? p.1095-1101, 1045-7	Sci. Method/Vision (16-18,23-7,37-43) Homology/Senses (27-30, 33-7, 50-54)	**Sun, 1/25:** Reflection #1
Last Day to Add Classes – Friday, January 23rd			
Week 3: Jan 27/29	Are All Animal Eyes Homologous? / Discussion: BLAST activity p.462-465, 529-530, 403	*BLAST Activity* (D2L Packet, Fig 26.8)* Student Research / Class Projects	**Sun, 2/1:** Reflection #2 / Ecol. Rsrch Pt1
Last Day to Drop Classes (Without a "W" on Record) – Friday, January 30th (or 2/1 online)			
Week 4: Feb 3/5	Who was Darwin? Wallace? / What Kind of Evidence Supports Evolution? p. 452-467, 473-480	Natural Selection (D2L Packet) Evidence of Evol. (45-9,55,84-6,163-7)	**Tues, 2/3:** *BLAST Wksht*
Week 5: Feb 10/12	What Changes Populations? / How Do We Know Evolution Happens? p.445-447, 525-529	HW Simulation (77-84) *Judgment Day (video + worksheet)*	**Thurs, 2/12:** Ecol Res. Pt2
Week 6: Feb 17/19	Journal Club – Evolutionary Patterns / Guest Lecture – Heather Bruce, Patel Lab, UC Berkeley	Journal Club (D2L Packet) Guest Lecture	**Tues, 2/17:** Judg. Day Wksht
Week 7: Feb 24/26	**Tues, 2/24 - Midterm 1** Where Did All This Diversity Come From? p.488-497, 502-504	**Midterm 1** Tree of Life Pt1: Explore (91-172 selection)	
Week 8: Mar 3/5	Meet the Animal Phyla / LAB: Tree of Life Pt 2 p. 654-6, 658-664, 697-701	Tree of Life Pt1: Score (D2L Packet) *Tree of Life Part 2: Build a Tree**	**Sun, 3/8:** Reflection #3
Week 9: Mar 10/12	Tree Discussions & Presentations p.734, 666-69 **Thurs, 3/12 - Lab Practical 1**	Tree Discussions & Presentations **Lab Practical 1**	**Tues, 3/10:** Tree Wksht
Week 10: Mar 17/19	How Do Animals Eat? / How Do Cells Get the Nutrients They Need? p.875-891	Digestive Sys: Dissections (247-262) Circulatory Sys: Dissections (267-288)	***LMC Open House- Sat, 3/21***
Week 11: Mar 24/26	How Do Animals Get Rid of Metabolic Waste? / How Does the Body Regulate Metabolism? p.1194-1200, 1202-5, 1184-5	More Comparative Anatomy: Dissections Continue (263-7, 114-118, 121-5, 151-3)	
Week 12: Mar 31/ Apr 2	Spring Break!!	Spring Break!!	**None!**
Week 13: Apr 7/9	How Do We Relate to Plants? p.958-968 / **Thurs, 4/9 - Midterm 2**	Evolution of Land Plants (173-215) **Midterm 2**	**Sun, 4/12:** Reflection #4
Week 14: Apr 14/16	What are Plants' Ancestors? p. 577-581, 590-597	Nature Preserve Podcasts (D2L Packet) Fungi, Protists, & Interactions (217-244)	
Week 15: Apr 21/23	What Implications Does a Growing Human Population Have for Our Changing Planet? p. 1254-6, 1172-79	Ecology Research Projects Revisit Biodiversity (6-8)	
Last Day to Withdraw from Classes (with W on Record) – Friday, April 24th			
Week 16: Apr 28/30	Sustainability & Preserving Biodiversity p.1187-1191	GMO Foods Lab (D2L Packet)	
Week 17: May 5/7	GMO Foods Discussion & Review **Thurs, 5/7 - Lab Practical 2**	Research Project Presentations Research Project Presentations	**Sun, 5/10:** Final Reflection
Week 18: May 12/14	**Tuesday, 5/12 8:00am – 9:20am - FINAL EXAM** Thursday, 5/14 – Reflecting on Science	Clean Up	Celebrate!