# Biodiversity, Evolution, & Ecology

**Bio 1 (CN 85169 & 85843) – Fall 2016**

**Instructor:** Dr. Timothy Davidson
**Office Hours:** M 1-2, W 2-4 or by appointment (SQU 114); **email:** Davidson@csus.edu

**Class Meetings:**
**Lecture**: MW 4:00-5:15pm (Sec 01 & 77); Location: SQU 338
**Laboratory:** M 5:30-8:20pm (Sec 02), W 1:00-3:50pm (Sec 78), or F 9:00-11:50am (Sec 04); HMB 110
**Activity:** M 10:00-11:50pm (Sec 05), M 2:00-3:50pm (Sec 79), or W 5:30-7:20pm (Sec 07); HMB 102

**Description:** Throughout this course, we will explore the evolution and diversity of living organisms and how these organisms interact with one another and their environment. We will introduce the properties of life and processes leading to genetic and biological diversity. Class meetings include lecture, laboratory, and activity sessions. Lectures will familiarize you with selected principles and concepts of biodiversity, evolution, and ecology. During weekly laboratory sessions, you will conduct studies associated with these concepts. Activity sessions will provide you an opportunity to read and interpret appropriate scientific literature, analyze data, and think critically. Designed for Science majors.

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

- Identify properties common to all living organisms.
- Explain the biological/phylogenetic basis of evolution and natural selection
- Explain the importance of alleles and population genetics.
- Appreciate the diversity and complexity of major lineages of life on earth.
- Recognize the major lineages of life on earth and their major characteristics.
- Discuss the ecological interactions among living organisms.
- Explain major biogeochemical cycles.
- Describe basic population properties and their interactions within an ecosystem.
- Analyze the interactions of different trophic levels within ecosystems.
- Develop and test hypotheses using the scientific method.
- Use basic scientific tools, including microscopes, computers, calipers, etc.
- Interpret results and communicate them in the structure of scientific literature.

**Textbooks & materials:**

Required: 1) Biology, 11th Edition, Raven et al 2016
2) Connect Access Code (needed for online homework & study resources)
3) Simple calculator - **No graphing calculators or phones for tests/quizzes**

**Grading:**

| Component | Assessment | Points | % of total |
|---|---|---|---|
| Lecture | Online homework (13 @ 10 pts) | 130 | 13% |
| | In class activities, quizzes, participation | 100 | 10% |
| | Exams (2 @ 100 pts) | 200 | 20% |
| | Comprehensive Final | 170 | 17% |
| | **Total Lecture Points** | **600** | **60%** |
| Laboratory | Instructor will provide point breakdown | 200 | 20% |
| Activity | Instructor will provide point breakdown | 200 | 20% |
| | **Total Course Points** | **1000** | **100%** |

**Grade Breakdown:** A (93-100%)**,** A- (90-92.9%), B+ (87-89.9%), B (83-86.9%), B- (80-82.9%), C+ (77-79.9%), C (73-76.9%)**,** C- (70-72.9%)**,** D+(67-69.9%), D (63-66.9%), D- (60-62.9%)**,** F (<60%)

**Online Homework & Readings:** I will assign online homework based on the lecture and readings from the previous week. They are due Sunday before midnight unless told otherwise. Please finish assigned readings before lecture. Readings fill in the gaps and provide details on lecture topics. You will see some questions based on readings in homework and on exams.

**Activities & quizzes:** We will be doing several in-class activities and/or small quizzes throughout the semester. Activities will be posted on SacCT and should be printed and brought with you. Some activities will require you to complete a pre-activity reading or online assignment. Quizzes will be given at random or if people are not paying attention, leaving early, or not completing the readings. **Missed activities & quizzes cannot be made up.**

**Exams:** Exams will be a mix of multiple choice, true/false, and short answer/essay questions. For exams, you will need a 1) ScanTron (#882-E), 2) pencil, and 3) pen for written questions.

**General Policies & Etiquette**:

- **Attendance:** Please attend regularly and be prepared for class. In-class activities can only be accomplished during lectures. If you are absent, it is your responsibility to obtain notes (or announcements/changes) from a classmate. Contact me if you have a legitimate excuse for missing an assignment/quiz/exam *before it is due*. I may require documentation of the emergency within 24 hr of your return.
- **Missing more than two lab or activity periods without a valid, authorized excuse will result in an F grade for the entire course. Please do not skip lab or activity!**
- **Late work is not accepted**. Please plan ahead and don't miss lecture!
- **Class materials:** I will upload class materials on SacCT. However, lecture notes are not a substitute for attending lecture as I provide additional details & materials in class.
- **If you have questions:** Please come see me during office hours! If you have short questions, email is acceptable. But I will not answer questions that can be answered by reading the syllabus or assignment. Also, because I receive dozens of emails a day, I may not get back to you very quickly.
- **Laptops/Cell phones**: I allow phones/laptops for note-taking as long as they do not disrupt others (visually or audibly). Put phones on SILENT & no social media, please.
- **Respect**: I respect all of my students and expect the same. Please do not talk while your instructor or others are speaking, fiddle with devices, or be disruptive/distracting.
- **Cheating**: I take cheating seriously because it is unfair to other students, disrespectful, & undercuts your own learning. Penalties range from getting a 0 to expulsion**.** I expect you to know what cheating is: **http://www.csus.edu/umanual/student/stu-0100.htm**
- **Disabilities**: Please contact me ASAP if you request accommodations for a disability. Please provide disability documentation to SSWD (Lassen Hall 1008, 916-278-6955)**.**

**Tips for Success:**

- **Attend & be engaged**. Studies show that students that engage in class do better. That means contributing to discussions, actively taking notes, asking questions, etc.
- **Study** materials *before* lecture & review again *after*. Best way to understand material is to explain it to others & test yourself. Devote ~2-3 hours for every lecture.
- **Sleep & exercise** are important for memory, retention, & engagement.
- **Remove distractions** when studying & reading. Recent studies show multi-taskers are not as efficient or productive as they think!
- **Ask questions** during class or office hours. If you have a question, other students probably do too. I want you to succeed and to enjoy biology as much as I do!
- **Take command of your learning.** I will do my best to help you understand the material but ultimately you're responsible for own learning. Develop good organizational skills. Use a scheduler to keep track of assignments/exams and plan ahead. Do not wait until the last minute to study for an exam or finish an assignment. Remember Murphy's Law...

**Tentative Schedule** (subject to change)

| | | |
|---|---|---|
| Week 1 | Introduction, Science of Biology, Darwin | |
| | 29 Aug | Course introduction, The Science of Biology |
| | 31 Aug | Introduction to Darwin & Evolution (Ch 1, Ch 20 to Hardy Weinberg) |
| Week 2 | Evolution | |
| | 5 Sept | *Labor Day – no class.* |
| | 7 Sept | Evolution & Natural Selection (finish Ch 20) |
| Week 3 | Origin of Species & Classification | |
| | 12 Sept | Evidence for Evolution (Ch 21) |
| | 14 Sept | Origin of Species (Ch 22) |
| Week 4 | Origin & Diversity of Life | |
| | 19 Sept | Systematics, Phylogenies, & Comparative Biology (Ch 23) |
| | 21 Sept | The Origin and Diversity of Life (skim Ch 26) |
| Week 5 | Catch up or Review & Exam 1 | |
| | 26 Sept | Complete Origin and Diversity of Life; Catch up or Review |
| | 28 Sept | **Exam 1 (Bring scantron, pencil, & pen!)** |
| Week 6 | Introduction to Ecology & Community Ecology | |
| | 3 Oct | Intro to Ecology, Population biology (Ch 55) |
| | 5 Oct | Community Ecology (Ch 56) |
| Week 7 | Ecosystem ecology, Conservation, & Human impacts | |
| | 10 Oct | Ecosystem Ecology (Ch 57) |
| | 12 Oct | Conservation Biology/Human impacts (Ch 58.5-58.6, 59) |
| Week 8 | Prokaryotes & Protists | |
| | 17 Oct | Prokaryotes (Ch 28) |
| | 19 Oct | Protists (Ch 29) |
| Week 9 | Exam 2 | |
| | 24 Oct | Catch up and/or Review |
| | 26 Oct | **Exam 2 (Bring scantron, pencil, & pen!)** |
| Week 10 | Plants | |
| | 31 Oct | Seedless plants: Mosses & Ferns (Ch 30) |
| | 2 Nov | Seed Plants (Ch 31) |
| Week 11 | Fungi | |
| | 7 Nov | Fungi (Ch 32) |
| | 9 Nov | Animal adaptations Activity |
| Week 12 | Animal Diversity: sponges, jellies & Protostomes | |
| | 14 Nov | Sponges & Jellies (Ch 33) |
| | 16 Nov | Protostomes: worms, mollusks (Ch 34) |
| Week 13 | Protostomes: worms, mollusks, nematodes, arthropods **(Thanksgiving week)** | |
| | 21 Nov | Protostomes: nematodes, arthropods (Ch 34) |
| | 23 Nov | Catch up, review, or Take-home Activity |
| Week 14 | Deuterostomes: sea stars, urchins, sea squirts, vertebrates | |
| | 28 Nov | Echinoderms, tunicates (Ch 35) |
| | 30 Nov | Vertebrates (Ch 35) |
| Week 15 | Catch up/Review session | |
| | 5 Dec | Catch up or Activity |
| | 7 Dec | Review session |
| **Final** | **14 Dec (Wed)** | **Comprehensive Exam (3:00-5:00 pm)** |
| | | **(Bring scantron, pencil, & pen!)** |