

**San José State University**  
**Department of Biological Sciences**  
**Biol/Bot 160, Ecology, Section 1, Fall, 2017**

**Course and Contact Information**

<b>Instructors:</b>	Drs. Scott Shaffer <sup>1</sup> & Lawrence Uricchio <sup>2</sup>
<b>Office Location:</b>	Duncan Hall 340
<b>Telephone:</b>	(408) 924 4871
<b>Email:</b>	<a href="mailto:Scott.Shaffer@sjsu.edu">Scott.Shaffer@sjsu.edu</a> & Lawrence.Uricchio@gmail.com
<b>Office Hours:</b>	<sup>1</sup> Monday & Wednesday at 11.00-12.00 (or by appointment) <sup>2</sup> TBD
<b>Class Days/Time:</b>	Lec – Section 01: Tuesday & Thursday at 10.30-11.45 Lab – Section 11: Thursday at 14.30-17.20 (Dr. Shaffer) Lab – Section 12: Friday at 10.30-13.20 (Olivia Townsend)
<b>Classroom:</b>	Lec: Duncan Hall 351 Lab: Duncan Hall 341
<b>Prerequisites:</b>	Prerequisite: BIOL 113 or 114 with a grade of "C" or better. Pre/Corequisite: BIOL 55 or BIOL 156 or equivalent biostatistics course; or instructor consent.
<b>GE/SJSU Studies Category:</b>	In conjunction with BIOL 115 this course meets the requirements for Area R

**Course Format:**

This course is an in-depth introduction to Ecology, taught by means of two 75-minute lecture/discussions and one three-hour lab experience per week. Some labs will be conducted in the field using equipment provided by the instructors (e.g. GPS units, compass, quadrats, and tape measures). Students will be expected to show proficiency in using the equipment and apply what was learned in the field to answer questions on lab practical's. Computer simulations may also be used in the lab to supplement lecture/lab topics. Students will be expected to purchase this software (\$12) but more details will be provided later.

**Faculty Web Page and MYSJSU Messaging**

Copies of course materials like the syllabus, major assignment handouts, etc. can be found by logging into the **Canvas webpage**. There, you should see the course listing with the link. You are responsible for regularly checking the messaging system through MySJSU and/or Canvas as we will periodically post updates. Please make sure that your email in the MySJSU system is the one you regularly check. This is the only email list we will use for correspondence. All project writing assignments **MUST** be uploaded to the Canvas Learning Management course website where they will be analyzed for plagiarism by Turnitin.com. Papers not submitted to Canvas in this manner will receive 0 points as will any assignments exhibiting plagiarism. Submissions **MUST** be in a word processor format (i.e. no PDF papers can be submitted).

## Course Description

Ecology is a fascinating area of science because it is here that we study how structural, functional, and behavioral adaptations come together to allow organisms to live and reproduce in the many, varied environments on Earth. It is cross-listed as Biology and Botany to allow for greater flexibility in courses completed and, for some students, taking ecology with a botany prefix gives them sufficient units to qualify for certain government jobs in ecology and conservation. This course meets part of the core curriculum for students in the B.S. Ecology and Evolution and the B.A. Biology concentrations.

## GE Learning Outcomes (GELO)

Upon successful completion of this program, students will be able to:

### SJSU GE Area R Student Learning Objectives

Area R Student Learning Objectives	Assignments that address this SLO
3. Apply a scientific approach to answer questions about the earth and environment.	Lab exercise (Apply Quadrat and Plotless sampling techniques) Assignment 2 (Compare and contrast Quadrat and Plotless sampling techniques) Lab Exercise (Corridor and Stepping Stones) Assignment 3 (Recommendation for Corridor and Stepping Stone exercise)
Other: Writing skills	

Assignment 1- Scientific Literature (50 pts) – You will read two documents and examine two websites that will be chosen by your instructor. You will compare and contrast the quality of the sources and then specify criteria that would provide credibility to a source (1000 words).

Assignment 2 – Compare and contrast Quadrat and Plotless sampling techniques (50 pts). In lab, you will learn how to determine tree density using two different sampling techniques, Quadrat and Plotless. In this assignment you will compare the two techniques with respect to how densities are computed and discuss strengths and weaknesses of each technique. Then you will make recommendations for when to use each (1000 words).

Assignment 3 – Recommendation for Corridor and Stepping Stone Exercise (50 pts). In lab, you will work in a group using a computer simulation to determine an optimum strategy for preserving the Fender's Blue butterflies. Each group will be required to give a Powerpoint™ presentation explaining their strategy with each group member participating. Each individual will then make a written evaluation of each of the strategies you tested and then present final recommendations (1000 words).

## Course Goals and Student Learning Objectives

### Program Learning Objectives (Department of Biological Sciences)

**PLO1:** Students will demonstrate the ability to formulate hypotheses and design experiments to address a scientific question.

**PLO2.** Students will demonstrate an understanding of the relevant content in their discipline.

**PLO3.** Students will demonstrate laboratory or field skills in their discipline.

**PLO4.** Students will demonstrate proficiency in scientific writing skills.

**PLO5.** Students will demonstrate proficiency in oral presentation skills.

## Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

**CLO1.** Develop an understanding of ecological concepts and processes. These include the eco-physiological basis for the distribution of living things, the factors governing the abundance of populations, and interactions within communities (PLO 1, 2, & 3; Essentially all lectures; Lecture exams 1, 2, & 3).

**CLO2.** Gain an understanding of scientific, social, political and economic aspects of ecological and global environmental issues (PLO 1, 2, & 3; Lectures 2, 4-6, 8 & 9, Lecture exams 1, 2, & 3).

**CLO3.** Understand how ecological constraints shape the daily lives of all organisms (PLO 1, 2, & 3; Lectures 2-5, 7-15, Lecture exams 1, 2, & 3).

**CLO4.** Use maps, compass and GPS to navigate and understand the terrain (PLO 1, 2, & 3; Labs 1, 2, 5, & 6, Lab practical 1 & 2).

**CLO5.** Understand how data are collected for addressing ecological issues. You will learn how to collect quantitative data and use that information (PLO 1, 2, & 3; Labs 2, 4-6, 8 & 9, Lab Practical 1 & 2).

**CLO6.** Improve your problem-solving abilities and communication skills; skills that are essential for future success, whether you go on to professional school, graduate studies or work in government and industry (PLO 4 & 5; written assignments 1, 2, & 3).

## Required Texts/Readings

There is no required textbook because elements from several books may be used. However, if you prefer to purchase a text, I would recommend **Elements of Ecology** (9<sup>th</sup>) by Thomas Smith. You can purchase this through most online retailers. Additional reading assignments and lab assignments will be posted on the Canvas page for this course.

## Other technology requirements / equipment / material

During labs when computer simulations will be used (i.e. SimBio), it is advisable to bring a laptop if you have one. Otherwise, netbooks will be provided. Students are still expected to purchase the software for a nominal fee (\$12).

## Course Requirements and Assignments

- SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty-five hours for each unit of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More guidelines on grading information and class attendance can be found from the following two university policies: [University Syllabus Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) at <http://www.sjsu.edu/senate/docs/S16-9.pdf> and [University policy F15-12](http://www.sjsu.edu/senate/docs/F15-12.pdf) (<http://www.sjsu.edu/senate/docs/F15-12.pdf>)

If you miss an assignment, a total of 5% per day will be deducted up to a total of 50% of the assignment grade. There should be no expectation of extra credit opportunities in this course.

The breakdown of assignments is as follows:

Assignments – For details, see Assignments discussed above under GE Learning Outcomes.

Lab exams – Lab exams will test your ability to make quantitative measurements, analyze data, perform techniques taught in field and lab exercises. Because of logistic issues for the technical staff, it is not possible to make up a lab exam.

Mid-term exams– Mid-term exams will test student knowledge and application of concepts covered in the lecture portion of the class. The tests may consist of multiple choice, true/false, definitions, short answer, and essay questions.

Classroom participation – Classroom participation is a very important component of the course. There are three ways in which each student participate: 1) answer questions posed by the instructor to randomly selected students, 2) pose insightful questions, and 3) participate in the group discussions and activities.

### Final examination

The final exam will test student knowledge and application of concepts covered in the lecture portion of the class. It is NOT cumulative and is essentially a midterm that cover the last section of course material. The format will be consistent with other midterm exams. More details can be found in [University Policy S06-4](http://www.sjsu.edu/senate/docs/S06-4.pdf) (<http://www.sjsu.edu/senate/docs/S06-4.pdf>) which states that “There shall be an appropriate final examination or evaluation at the scheduled time in every course, *unless the course is on the official List of Courses in which a final is optional.*”

### **Grading Information**

Evaluation: Final grades are based on a percentage of the total accumulated number of points and assigned a letter grade according to the standard University grading system:

% of Points	Letter grade	% of Points	Letter grade	% of Points	Letter grade
98	A+	80	B-	62	D
92	A	77	C+	60	D-
90	A-	72	C	>59	F
87	B+	70	C-		
82	B	67	D+		

Each students’ percent score will be rounded up or down to the nearest whole number. **Do NOT expect grades to be curved nor extra credit to be offered.**

<b>Activity</b>	<b>Learning Objectives</b>	<b>Pts</b>	<b>% of Total</b>
Lab exams – Two @ 100 pts each	1, 4-10	200	29
Lecture exams – Two @ 100 pts each	1-3,6-10	200	29
Final exam – One @ 100 pts	1, 4-10	100	14
Classroom participation	8,9	50	7
Assignments – Three @ 50 pts each	See GE Learning Outcomes	150	21
	TOTAL	700	100

*Remember: A minimum aggregate GPA of 2.0 SJSU Studies (R, S, & V) shall be required of all students as a graduation requirement.” To see full text, review University Policy S11-3 at <http://www.sjsu.edu/senate/docs/S11-3.pdf>.*

### **Grading Information for GE**

This course must be passed with a C or better as an SJSU graduation requirement. Passage of the Writing Skills Test (WST) or ENGL/LLD 100A with a C or better (C- not accepted), and completion of Core General Education are prerequisite to all SJSU Studies courses. Completion of, or co-registration in, 100W is strongly recommended. A minimum aggregate GPA of 2.0 in GE Areas R, S, & V shall be required of all students.

### **Classroom Protocol**

*Participation and attendance:* You are expected to attend and participate in every class and lab or field exercise. Missing class or lab will make it more difficult for you to succeed in the course.

*Lecture and Lab Exams:* Exam dates are not expected to change and there will be **no make-ups** of exams allowed. **No exceptions.**

### **University Policies**

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at <http://www.sjsu.edu/gup/syllabusinfo/>”

## Biol/Bot 160 – Ecology, Fall 2017, Lecture Schedule

*Note that the schedule is subject to change. Any changes will be announced via the Canvas website and during class*

Lecture Schedule (lecturer: Shaffer – Sh; Uricchio - Ur)

Week	Date	Who	Topics & Deadlines
1	8/24	Sh	Introduction to course, logistics, and the topic of Ecology

### *Physiological Ecology*

2	8/29	Sh	Marine environment and adaptations
2	8/31	Sh	Estuarine/Freshwater environments and adaptations
3	9/05	Sh	Terrestrial adaptations
3	9/07	Sh	Other physical environmental factors

### *Population Ecology*

4	9/12	Ur	Primary population characteristics
4	9/14	Ur	Primary population characteristics & Population growth and regulation
5	9/19	Ur	Population growth and regulation
5	9/21	<b>Sh</b>	<b>LECTURE EXAM 1</b>
6	9/26	Ur	Metapopulations
6	9/28	Ur	Life history patterns

### *Community Ecology*

7	10/03	Ur	Competition
7	10/05	Ur	Competition
8	10/10	Ur	Predation
8	10/12	Ur	Predation
9	10/17	Ur	Parasitism/mutualism
9	10/19	Sh	Community structure
10	10/24	Sh	Community change – Succession
10	10/26	Sh	Community change – Succession
11	10/31		<b>LECTURE EXAM 2</b>
11	11/02	Sh	Landscape ecology
12	11/07	Ur	Biogeography

### *Ecosystems Ecology*

12	11/09	Ur	Productivity/Energy flow
----	-------	----	--------------------------

Week	Date	Who	Topics & Deadlines
13	11/14	Sh	Nutrient cycling and microbial ecology
13	11/16	Sh	Ecosystem services
14	11/21	Sh	Biodiversity patterns
15	11/28	Sh	Urban ecology
15	11/30	Sh	Conservation
16	12/05	Sh	Sustainability
16	12/07	Sh	Catch up and/or Review
Final Exam	12/18	<b>Sh</b>	<b>FINAL EXAM at 09.45 – 12.00 in DH 351</b>

## Biol/Bot 160 – Ecology, Fall 2017, Laboratory Schedule

*Note that the schedule is subject to change. Any changes will be announced via the Canvas website and during class*

### Laboratory Schedule

Week	Date	Topics	Type	Readings
1	8/31 & 9/01	Navigation introduction	Lab	Chap 1-2
2	9/07 & 9/08	Map reading and sample size selection	Lab	Chap 3-4
3	9/14 & 9/15	Water relations	Lab	Chap 5
4	9/21 & 9/22	Population growth (Isle Royale)	Lab	Chap 6
5	9/28 & 9/29	Quadrat sampling	Field	Chap 7
6	10/05 & 10/06	Quadrat analysis/tracking (i.e. Assignment 2)	Lab	Chap 8
<b>7</b>	<b>10/12 &amp; 10/13</b>	<b>LAB EXAM 1</b>	<b>Lab</b>	<b>Review Chaps 1-8</b>
8	10/19 & 10/20	Mark & Recapture – Population Density (A2 Due)	Lab	Chap 9
9	10/26 & 10/27	Catch per unit effort – Population Density	Lab	Chap 10
10	11/02 & 11/03	Corridors & Stepping Stones (Assignment 3)	Lab	Chap 11
<b>11</b>	<b>11/09 &amp; 11/10</b>	<b>No Labs in observance of Veteran's Day</b>		
12	11/16 & 11/17	Intrapopulation dispersion (A3 Due)	Field	Chap 12
<b>13</b>	<b>11/23 &amp; 11/24</b>	<b>Thanksgiving – Turkey dissection</b>	Home	
14	11/30 & 12/01	Intrapopulation dispersion analysis	Lab	Chap 13
<b>15</b>	<b>12/07 &amp; 12/08</b>	<b>LAB EXAM 2</b>	<b>Lab</b>	<b>Review Chaps 9-13</b>