

Syllabus

**Terrestrial Ecosystem Science Lab
Biology 596L
Spring Semester, 2010**

Credit hours: 2

Maximum number of enrollment: 18

Meeting Location and Time: LS-235, T Th 1400-1640

Instructor: Professor Chun-Ta Lai

Office: PS 152/154

Email: lai@sciences.sdsu.edu

Phone: 619-594-0678

Office hours: M 14:00-15:30, Th 10:00-11:00, or by appointment

Course Description: This course is meant to be taken in conjunction with the Biol544 'Terrestrial Ecosystem and Climate Change' lecture course. Ecological methods used in ecosystem and climate change science will be introduced and conducted. Analytical approach includes chemical analysis and meteorological measurements. Chemical analysis will focus on stable isotope ratio and elemental determination using instruments in the Ecology Analytical Facility. Data analyses, including modeling, and presentations will be required to interpret experimental results. There will be field trips to collect samples and possible visits to local research institute/facility to promote the awareness of global change research.

Course Objectives: After taking this course, students should be able to:

- be familiar with the analytical skills learned in this course
- collect ecological samples and know proper storage for laboratory analysis
- apply analytical skills learned from this course in thesis projects
- explain principles of instrument operation and function
- independently form and test hypothesis of science
- diagnose measurement errors and avoid misinterpretation of data
- present experimental data in a logical manner
- appreciate uncertainties associated with model forecast
- understand laboratory safety to prevent injury
- enhance ability of critical thinking and learn how to effectively synthesize useful information

Textbook: *Methods in Ecosystem Science*, OE Sala, RB Jackson, HA Mooney, RW Howarth, Springer-Verlag, New York, 2000.

Course Prerequisites: Biol 291, 544 (or concurrently enroll)

Course elements and organization

The course will begin with an introduction to explain laboratory guidelines, safety issues and methods to be used. Lab activities are structured around 4 study themes. Each theme requires 3-4 weeks of participation and begins with an introduction of methods and objectives. Students will work in a team format by first selecting a study target (flora, fauna or ecosystem), followed by collecting, preparing and analyzing samples as a group. In the final week of every study theme each individual presents results to the class and returns a written report following the presentation.

Course Outline (tentative; final lecture topics are subject to minor changes)

Week	Date	Topic
1	1/21	Introduction – Lab safety, general guidelines, methods and expectations
2	1/26 1/28	Theme 1: Micrometeorology Method, instruments and literature review
3	2/2 2/4	Weather data collection and analysis <i>Dr. Lai's furlough day – No class</i>
4	2/9 2/11	Presentation and report due
5	2/16 2/18	Theme 2: Photosynthetic pathways Stable carbon isotope method and literature review
6	2/23 2/25	Sample collection and preparation
7	3/2 3/4	Sample preparation and analysis
8	3/9 3/11	Presentation and report due <i>Dr. Lai's furlough day – No class</i>
9	3/16 3/18	Theme 3: Trophic linkage Stable carbon and nitrogen isotope method and literature review
10	3/23 3/25	Sample preparation and analysis <i>Dr. Lai's furlough day – No class</i>
11		Spring break, no classes
12	4/6 4/8	Presentation and report due
13	4/13 4/15	Theme 4: Plant water relation & water quality Stable oxygen and hydrogen isotope method and literature review
14	4/20 4/22	Sample collection <i>Dr. Lai's furlough day – No class</i>
15	4/27 4/29	Sample preparation and analysis
16	5/4 5/6	Presentation and report due
17	5/11	Field trip to Scripps Institute of Oceanography

Project presentation and report: Every student is required to participate in group presentation. Presentations should be given by PowerPoint. Experimental findings should be interpreted and contrasted with theoretical predictions in literature. Each student must present to the class during a 20-minute talk, including 5 minutes for questions and discussion. Presentations should begin with a hypothesis, demonstrate the sample

preparation process, major findings, and discuss potential errors/difficulties encountered during the experiment. I expect students to give appropriate credits to ideas from others (group members, published articles and textbooks). **Use citations!**

Each individual will require submitting a three-page written report for each study theme. All written assignments should be typed/word-processed, 12 pt. font, 1” margins, and double-spaced, with each page numbered. Written reports should be submitted in PDF format (preferred via emails) and received on the day of presentation. **Submission after deadline will not be accepted.**

Grading

Student performance will primarily be evaluated on individual contributions to group projects: students are required to design an experiment, collect samples, analyze results, and report those results to the rest of the class in both written and oral forms. Each group will receive feedbacks from their peers and the instructor. 2-3 students are expected to form a group. Lab worksheets will be used to encourage in-class participation and aid evaluation.

The final grade will be determined by the total points earned by each student (not as a group), following the breakdown below:

1. Presentation (50 x 4 = 200 pts, 40%)
2. Written report (50 x 4 = 200 pts, 40%)
3. Lab Worksheets (25 x 4 = 100 pts, 20%)

Grading scale (out of a total 500 pts)

A	(> 465 pts)	C+	(385-399 pts)
A-	(450-465 pts)	C	(365-384 pts)
B+	(435-449 pts)	C-	(350-364 pts)
B	(415-434 pts)	D	(300-349 pts)
B-	(400-414 pts)	F	(< 300 pts)

Attendance and participation: A considerable portion of the course will involve projects done by small groups of students. Depending on the nature of each project, students may need to schedule blocks of **out-of-class time** to prepare experimental setups, make observations, and conduct data analysis. Later on, some lab periods will be freed up to allow time for your course projects.

Student responsibilities: Please review the syllabus carefully regarding course content and grading policies if you decide to take this course. Students should always confirm with me for any electronic submissions of course assignments. It is student responsibility to assure an electronic submission has been received by me. Students are expected to maintain professional behavior in the classroom setting according to the Standards for Student Conduct specified in the California Code of Regulations. Cheating is rarely an issue in ecology courses; however, please note that **University regulations concerning plagiarism and cheating will be strictly enforced.**

Furloughs and class cancellation. Due to extraordinary budget cuts to the CSU, fees to students have increased 32%, many sections have been cut and faculty will be required to take nine (9) unpaid furlough days each semester. A furlough is mandatory un-paid time off; faculty and staff on each CSU campus are being "furloughed" two days per month. These furlough days will unfortunately mean that we will be unable to include all elements of this class that we believe would provide the best educational experience. Unfortunately this is the result of a dramatic cut to the CSU by the state after years of under-funding the system. This class will not meet, and we will not be available for office hours, phone or email consultation on the following regularly scheduled days: February 4, March 11, March 25 and April 22.

Dropping: If you decide this is not the course you want to take, the last day to drop is February 02, 2010.