IB 157 LF Ecosystems of California Fall 2014

Instructor: Paul Fine, 4014 VLSB, (paulfine@berkeley.edu), 642-7690
GSI: Aaron Ramirez (aramirez4916@berkeley.edu)
Office Hour: Wednesdays 2-3 PM in 4014 VLSB (and by appointment).

Lecture and Discussion: W 10am-noon, 3003 VLSB
Field Trips: F 10am-5:00pm, meet at West Circle "loading zone" near VLSB
Book: Trees and Shrubs of California by Stuart and Sawyer (2001, UC Press)
Reader: Available at Copy Central on Bancroft. There will also be a reader placed on reserve in the Biosciences Library. Readings for field trips from Holland and Keil (1995) California Vegetation are optional and this book is placed on reserve in Biosciences as well.

Description: The ecosystems of California will be studied from both an ecological and historical biogeographical perspective. Our focus will be on the terrestrial plant communities found in California. We will learn the evolutionary and biogeographical histories of California's plant lineages, and the dynamic nature of plant communities in California over geological time as well as over the past several thousand years of human history. We will investigate the relative importance of the biotic and abiotic factors that determine which species are found in which environments. We will consider the plant traits that are associated with turnover in species composition along environmental gradients. Along the way, we will learn how to identify 130-150 species of plants native to California (mostly trees; but also other dominant plants from the non-forest biomes). There will be Friday field trips and several weekend field trips. Students will learn how to take detailed field notes and will be tested with field practicals (plant identification) and written exams (about the ecology and comparative biogeography that has determined the "assembly" of the flora of California). Students will learn how to collect, press, dry, and mount plant specimens and use the Herbarium.

Lectures: Wednesday lectures will last approximately one hour, and will give context for the field trips as well as introductory material related to forest ecology, biogeography and the evolution of the California flora. For the remaining time, we will discuss lecture material, and give information about upcoming field trips and organize rides, meals, and other logistics. Some weeks we will use some of this time to visit the University and Jepson Herbaria and Museum of Paleontology as well as mount our own plant specimens.

Field Trips: All field trips are **mandatory**. We will have 9 day-trips and four weekend field trips (and one overnight field final). Our goal is to see (almost) all of the native trees of the California Floristic Province in the field and learn how to identify them – in addition to many of the dominant shrubs and other important plants. We will accomplish this by learning key "sterile characters"; leaves, bark, growth form etc. – instead of focusing on flowers and fruits which are not always present on the plant. We will learn 10-13 species of plants per day per field trip and each field trip will include a quiz. We will also learn to take detailed notes regarding the natural history of the vegetation at each site which will be turned in for credit. Quizzes and Field exams will consist of plant identification and natural history. During the weekend field trips we will stay either in bunkhouses (UC Reserves) or camp in tents. We will bring and prepare our own food.

Grading: Lecture Midterm: 10%
Lecture Final: 20%
Field Quizzes (10): 35%
Natural History Notes: (11): 10%
Field Midterm: 10%
Field Final: 15%

Special Notes:

1) If you are enrolled in this class, check the syllabus and field trip schedule carefully and plan accordingly. All field trips are mandatory and they cannot be made up at an earlier or later date. You MUST attend the first two lectures and sign the attendance forms to remain enrolled in this class. The first overnight field trip is Friday September 5th, and only students who have attended class the previous two class periods will be allowed to participate.

2) If you are on the wait list -- do not lose hope -- many of the students on the wait list will end up being enrolled in the class. Just attend all classes the first two weeks of the semester. Many of the enrolled students will not show up and if you have signed the attendance forms the first two classes, the first 22 enrolled or wait-listed students will be allowed to officially enroll in the class.

3) We make our best effort for Friday field trips to leave on time at 10:10 am and return by 5:00pm. However, sometimes despite our best intentions, we return late due to traffic or other unforeseen complications. I estimate that this will occur 1-3 times during the semester. It is very important that all students have a good attitude about occasional late returns on Fridays. If you have an extracurricular activity that is important to you on Fridays such that you always will be worried about returning to campus on time, I suggest that you either plan ahead to sometimes be late or drop the course and save yourself the stress.

4) We make our best effort for weekend field trips to return on Sunday before 5 PM. However, some of the field trips involve large distances and road conditions are always unpredictable. You must be prepared for an occasional late return.

5) The Veterans Day trip to the Channel Islands will require students to miss their other classes on Monday, November 10th and will involve a very late return to Berkeley on Tuesday, November 11th.

6) Note that the Field Final is scheduled for December 5th and may involve an overnight stay. This will include a final dinner and award ceremony. We will return to campus either late at night on the 5th around noon on Saturday, December 6th.

7) Attending class on Wednesday is required in order to obtain information about the upcoming field trip and organizing the driving, the food, and other logistics.

Lectures

Friday, Aug. 29th 10am-5pm: *Course overview, Importance of Natural History in Biological Investigation and First Field Trip (See Field Trip list)*

Wednesday September 3rd, 10am-noon: *Vegetative Morphology, Taxonomy, Nomenclature*

Wednesday, September 10th, 10am-noon: *What is "California?" Introduction to the California Floristic Province*

Wednesday, September 17th, 10am-noon: *What is an "Ecosystem?" Concepts of Ecosystems, Communities and Vegetation Types*

Wednesday, September 24th, 10am-noon: *Climate and Soils: Abiotic factors Influencing Vegetation Composition*

Wednesday, October 1st, 10am-noon: *Fire and Other Disturbances and their Effects on California Plant Communities*

Wednesday, October 8th, 10am-noon: *Biotic Interactions and Plant Communities: Plant Competition, Natural Enemies, Pollinators, Dispersers*

Wednesday, October 15th, 10am-noon: **Lecture Midterm**

Wed., October 22nd,10am-noon: *Evolution, Speciation, and Adaptation in California Plants and*

Wednesday, October 29th, 10am-noon: *The ecology of invasive species and effect on California ecoystems*

Wednesday, November 5th, 10am-noon: *Deep History-California from 100 to 1 million years ago*

Wednesday, November 12th, 10am-noon: *The Pleistocene Era to the present: Management by Native Californians followed by Colonization, Conversion, and Conservation*

Wednesday, November 19th, 10am-noon: *The Future of California Ecosystems*

Wednesday, December 3rd, 10am-noon, *Field Final Review* (*Tilden Park Botanic Garden*)

Field Trips

Friday, August 29th: *Samuel Taylor State Park (Marin Co.)*

*Friday, September 5th-Sunday September 7th: *Van Damme State Park (Mendocino Co.)*

Friday, September 12th: *Sunol Regional Wilderness (Alameda Co.)*

*Friday, September 19th - Sunday, September 21st: *Sequoia National Park*

Friday, September 26th: *Mt. Tamalpais State Park*

Friday, October 3rd: *Point Reyes National Seashore*

Friday, October 10th: *Field Midterm, Robert Louis Stevenson State Park (Napa Co.)*

Friday, October 17th: *Mt. Diablo State Park, Mitchell Canyon area*

*Friday, October 24th-Sunday, October 26th: *Santa Lucia Mts, Big Sur (Big Creek Natural Reserve), Pt. Lobos State Park*

Friday, October 31st: *Strawberry canyon fire trail, UC Berkeley Ecological Study area*

*Friday November 7th – Tuesday November 11th: *Southern California &Channel Islands: Santa Cruz Island (UC Natural Reserve)*

Friday, November 14th: *Año Nuevo State Reserve: (Quiroste Valley State Cultural Preserve) (San Mateo Co.)*

Friday, November 21st: *Full Belly Farm, Guinda (Yolo Co.)*

Friday, November 28th, NO FIELD TRIP, THANKSGIVING HOLIDAY

*Friday, December 5th –Saturday, December 6th, **Field Final** (SECRET LOCATION)

IB 157LF Lectures and Readings
Fall 2014

Friday, Aug. 29th 10am-5pm: *Course overview, Importance of Natural History in Biological Investigation and First Field Trip (at Samuel Taylor State Park)*

Reading: Fleischner (2011);
Walters & Keil 1996 pp. 29-40. Vegetative terminology.

Wednesday September 3rd, 10am-noon: *Vegetative Morphology, Taxonomy, Nomenclature*

Reading: Holland & Keil (H&K): Chapter 6 pp. 101-107

Wednesday, September 10th, 10am-noon: *What is "California?" Introduction to the California Floristic Province*

Reading: H&K, chapter 1, chapter 2 pp. 35-38, chapter 3.
Natural History of Big Sur , pp. 7-47.

Wednesday, September 17th, 10am-noon: *What is an "Ecosystem?" Concepts of Ecosystems, Communities and Vegetation Types*

Reading: H&K, chapter 5.

Wednesday, September 24th, 10am-noon: *Climate and Soils: Abiotic factors Influencing Vegetation Composition*

Reading: Morris et al. pp. 29-8 – 29-12;
Barnes et al. pp. 140-148.

Wednesday, October 1st, 10am-noon: *Fire and Other Disturbances and their Effects on California Plant Communities*

Reading: Fire in California's ecosystems: chapter 6, pp. 94-103;
Keeley et al. (2012) pp. 125-140; 241-258.

Wednesday, October 8th, 10am-noon: *Biotic Interactions and Plant Communities: Plant Competition, Natural Enemies, Pollinators, Dispersers*

Reading: Barnes et al. pp. 182-199.
Morris et al. pp. 32-8 – 32-18.

Wednesday, October 15th, 10am-noon: **Lecture Midterm**

Wednesday, October 22nd,10am-noon: *Evolution, Speciation, and Adaptation in California Plants*

Reading: Judd et al. chapter 6.

Wednesday, October 29th, 10am-noon: *Ecology of invasive species and effect on California Ecosystems*

Reading: Blossey and Notzold (1995)

Wednesday, November 5th, 10am-noon: *Deep History-California from 100 to 1 million years ago*

Reading: Willis & McElwain, pp. 194-231;
H&K chapter 4.
Graham chapter 3.

Wednesday, November 12th, 10am-noon: *The Pleistocene Era to the present: Management by Native Californians followed by Colonization, Conversion, and Conservation*

Reading: Graham pp 273-290;
Fire in California's ecosystems: chapter 17;
"The Collaborative Research Program at Quiroste Valley" News from Native California *News from Native California* (2008) by Kent Lightfoot, Chuck Striplen and Rob Cuthrell.
"Exploring Indigenous Landscape Management at Quiroste Valley, The Archaeological Approach", *News from Native California* (2009) by Rob Cuthrell, Chuck Striplen, and Kent Lightfoot

Wednesday, November 19th, 10am-noon: *The Future of California Ecosystems*

Reading: Kay (2002);
Donlan et al. (2005);
M. Pollan, "Introduction: Our National Eating Disorder" from The Omnivore's Dilemma

Wednesday, December 3rd, 10am-noon, *Field Final Review* (*Tilden Park Botanic Garden*)