

# Ecology and Natural History of the Sonoran Desert and Upper Gulf of California

*Hands-on learning & individual field research projects with faculty and scientists.*

## What should I expect?

Hands-on, residential, **field-based exploration** of the Sonoran Desert, its Sky Islands, and the Upper Gulf of California. Students will be introduced to the ecological, taxonomic, and natural-history diversity of the region. To accomplish this ecological Sense-of-Place immersion, we will conduct several small independent research projects, visit with topical experts, foray into some of the most beautiful and iconic portions of the desert southwest, and read about the important, exciting, and interesting ecological science to come out of the area. Be prepared to take notes, draw, think, explore, synthesize data, develop short presentations, and relay your findings to your peers and instructors. Students should be prepared for, and able to participate in, desert & mountain **hiking, camping, and boating**. Sleeping accommodations will vary from Biosphere 2 casitas, to shared tents, to sleeping mats on the deck at CEDO. Transportation will be in UA-fleet passenger vans.

## What are the course objectives?

Students will learn ecological principles, methods of observing, sampling, and collecting data, local flora and fauna, examples of ecological interactions and processes, simple data analysis, as well as interpretation and presentation of research results. Conservation status of Sonoran Desert species and ecosystems will be a sub-theme of the course. Interactions among students, instructors, and the many scientists and faculty we will work with, facilitate achieving our course objectives and allow for development of long-lasting professional relationships.

## What are the assignments?

- 1. Pre-course assignments:** 1) ecosystem/ecological process, 2) personal introduction
  - we will assign you the first one
  - for the second, prepare a short (3 min) introduction to what makes you unique
- 2. Participation & Attitude**
  - engaged, inquisitive, enthusiastic, helpful, considerate, etc.
- 3. Keeping a Field Journal**
  - notes, observations, drawings, maps, data, ideas, reflections, questions
- 4. Independent & Group Research Projects**
  - including development of questions & study design
  - data collection & data analysis
  - presentation of results (visual, oral, and/or written)

## How will I be evaluated?

Pre-course assignments: 10%, Participation/Attitude: 25%

Field Journal: 30%, Research Projects: 35%

Final letter grades based on standard 90+=A, 80+=B, 70+=C, 60+=D.

I do not plan to allow students to take the course pass/fail or for audit credits.

## How do I register?

Registration for UA students available late March via [UAccess](#). Course is [ECOL463](#) or [ECOL563](#). If you are not a UA student then please visit <http://summer-winter.arizona.edu/>. Click the 'admission' tab on the left, followed by the 'summer only' application link. Following your application submission a UA response email (takes ~ 2 days) will tell you how to enroll. For other questions, please contact the instructor or the [EEB](#) office. Expectations for graduate student (563) performance will be greater than for 463 students.

## What is different about 4, 5, and 6 credits?

- Described course assignments and evaluation criteria above are for the first 4 credits.
- For the 5<sup>th</sup> credit, students will be expected to develop and execute at least one significant lesson or exercise that teaches the rest of the group about ecology/biology/natural history/Sonoran desert. The scope and topic of the lesson(s) will be decided upon in consultation with the instructors.
- For the 6<sup>th</sup> credit, students will be asked to further develop one of the research projects generated during the course and convey the results in the context of the relevant scientific literature in both written and presentation form. Again, details of the scope and topic will be decided upon in consultation with the instructors.
- You are also welcome to propose your own idea of what scholarship merits the additional 5<sup>th</sup> or 6<sup>th</sup> credit. Mutually agreeable suggestions can be substituted for the above descriptions of credits beyond the first 4.

## Can I receive Honors credit?

Yes! Descriptions of expectations for 5<sup>th</sup> and 6<sup>th</sup> credits could also serve as a starting point for an enhanced [Honors](#) experience. Mutually agreeable supplements and adjustments to the course appropriate for Honors credit will be determined prior to the course commencing.

## What does it all cost? (Plus UA application fee?: instate \$50, out of state, \$65)

- The [Arizona Board of Regents](#) approved the course fee of **\$1250**.
- Additionally, you will pay [UA precession tuition](#) for 4, 5, or 6 credits. The costs are slightly greater for 563 enrollment and for additional credits. 2013 costs as a guide:
  - 463 Undergraduate Credits: 4 = \$1,579; 5 = \$1,959; 6 = \$2,339
  - 563 Graduate Credits: 4 = \$1,759; 5 = \$2,184; 6 = \$2,609
- Expect to spend money for about 8 meals during the course, additional beverages, personal items, laundry (if needed), souvenirs, etc.

## What does my course fee and tuition cover?

All lodging and transportation during the course is included. Students can bring personal vehicles for some parts of the course. About 85% of meals are included; snacks will be provided as well. Entrance fees to museums, national parks, campgrounds, etc. will be included. Field research equipment will be provided. Institutional fees, visitor stipends, and contributing-scientist honoraria are also covered.

# What is the schedule?

(18 days afield; subject to change, **updated 19 Feb 2014**)

**Tuesday May 20<sup>th</sup>** – Meet at U. of Arizona **9:30am**, then drive south of Tucson for 2 nights camping at [Raven's Way Wild Journeys](#), in the Santa Rita foothills. Visit [Tumamoc Hill](#), explore and study nearby grassland and desert habitats, meet resident species, and enjoy [Patagonia Lake](#).

**Thursday May 22<sup>nd</sup>** – drive to [Biosphere 2](#). Stay 3 nights at B2 in casitas, with numerous excursions, visiting experts, hikes, and projects. Visit [Arizona-Sonora Desert Museum](#), and [Catalina State Park](#).

**Sunday May 25<sup>th</sup>** – Move via Tucson to campground on [Mt Lemmon](#) at 8,000' elevation. [Campground](#) has water, toilet facilities, and electricity. You bring tent and sleeping gear! Stay 5 nights at campground with activities and projects up and down this sky-island mountain, at the [UA SkyCenter](#), at [Saguaro National Park](#), and with visiting scientists.

**Friday May 30<sup>th</sup>** – To [Tucson](#) for 1 night off (or possibly in the [dorms](#) on the campus of the University of Arizona for out of town students). May visit campus museums, downtown attractions, local restaurants, laundromat if needed, stores, etc.

**Saturday May 31<sup>st</sup>** – From Tucson we head through the [Tohono O'odham nation](#) to [Organ Pipe Cactus National Monument \(ORPI\)](#) where we will camp for 2 nights. This will be our hottest overnight locale, allowing us to learn about an amazing part of the Sonoran Desert and visit with National Park Service biologists and staff.

**Monday June 2<sup>nd</sup>** – From ORPI we will cross the border into Mexico at the Lukeville/Sonoyta crossing. We will spend much of the day at the [Pinacate Biosphere Reserve](#) exploring the volcanic craters and cinder fields. By evening we will be in [Puerto Peñasco \(Rocky Point\)](#) on the Pacific coast of the Gulf of California.

**Tuesday June 3<sup>rd</sup>** – We will wake up in our sleeping bags on the deck at [CEDO](#) (Intercultural Center for the Study of Deserts and Oceans) for 4 days of coastal, intertidal, estuary, island, and marine ecology. Be ready for hiking, wading, swimming, snorkeling, kayaking, and boating. CEDO has been studying, protecting, and teaching about the Upper Gulf of California for more than 30 years.

**Friday June 6<sup>th</sup>** – Midday we will depart CEDO and Puerto Peñasco headed back to Arizona and Tucson. Course concludes.

# What gear/equipment/supplies do I need?

## Books etc.:

- field notebook (approx. 4" x 7" is a useful size), pen, pencil, sharpie
- A Natural History of the Sonoran Desert*. 2000. ASDM Press (\$25) [see also [Arizonensis](#) web resource]
- A Natural History of the Santa Catalina Mountains*. 2013. ASDM Press (\$25)
- Other shorter readings and PDFs will be posted online closer to the course start date

### Optional Suggestions in addition to above Required resources:

- Dry Borders*. 2007. Felger & Broyles (approx \$35); *When the Rains Come*. 2009. Alcock (approx \$15)
- ASDM website; [Desert Ecology of Tucson](#), Brad Fiero, Pima Community College, web resource - great links
- [Sonorensis](#), ASDM (electronic), 2008, Jaguars; 2005, Conservation; 2004, Climate Change; 2002, Sea of Cortez
- The Log from the Sea of Cortez*. Steinbeck (approx \$10); *The Gulf of California*. 2010. Brusca (approx \$60)

## Field Equipment:

- sleeping bag, sleeping pad
- headlamp (or flashlight, but hands-free preferred)
- hiking boots or other closed-toe shoes suitable for desert terrain
- refillable water bottles (2-3 liters total)
- wide-brim hat for sun protection
- backpack for day hiking and field exploration
- long pants, long sleeve shirt
- raincoat
- cup/mug, plate/bowl, fork, spoon, knife

To rent gear: [UA Outdoor Adventures](#)

## Other:

- PASSPORT** or other Homeland Security approved documents for crossing US-Mexico border
- additional clothes including shorts, shirts, sweatshirt, underwear, socks, swimsuit
- \$ cash and debit/credit card
- toiletries & medicines, towel, eyeglasses/contacts

## Highly Recommended:

- sunscreen & sunglasses
- digital camera with memory cards, charger/batteries
- sandals (e.g., Texas/Chacos)
- binoculars
- laptop/netbook/ipad – very useful for data entry & analysis, presentation preparation, photos
- extra batteries
- thumb/flash drive
- small duffel bag for leaving some gear behind at times
- 'ziplock' plastic bags

## Optional:

- tent (or arrange to share)
- snorkeling gear – we can rent in Puerto Penasco for our group snorkeling outings, including wetsuit.
- ipod/mp3 player
- telephone
- GPS unit, compass, hand lens
- waterproof bag/box for boat outings

## Is it safe to travel in these areas at this time?

Venturing out into desert, ocean, and foreign country for memorable educational and inspirational experiences comes with some manageable risks.

Inherent risks that come with hiking in the desert include heat stress and dehydration, venomous animals, painful plants, twisted ankles, etc. While studying the natural world you are exposed to the elements and to the defenses of the resident plants and animals. However, we will take responsible, prudent, and preventative steps to lessen the likelihood of any problems. This includes safe conduct and use of flotation devices when boating and kayaking.

Traveling by vehicle on highways, city streets, and remote roads also carries with it the slight risk of mechanical failure or accident. Again, we will take appropriate steps to reduce the likelihood of problems by using well-maintained fleet vehicles, distributing weight appropriately, driving safely, and traveling in caravans when warranted.

The Sonoran desert region is unfortunately a hub of smuggling activity of both undocumented persons and illegal drugs. The demand for drugs in the US ensures a steady supply from south of the border and the constant, sometimes violent, struggle for control of this lucrative, but illegal trade. Immigrants looking for employment north of the border are also a source of revenue for people smugglers ('coyotes'). Violence is not unheard of in southern Arizona and northern Sonora. We will choose when and where to be, and with whom, to minimize chance encounters with any dangerous situation. Our CEDO lodging in Mexico is part of a beach-side subdivision called Las Conchas with 24-hr security and many hundreds of American vacation homes. Being keenly aware of our surroundings will further allow us to avoid problems. The only crimes I have experienced in more than 25 years of travel to Sonora and Puerto Peñasco are a stolen sleeping bag from an unattended tent (1991) and spray-painted graffiti on the side of a UA passenger van late at night (2006).

[For updates, visit [US Department of State, Mexico](#). See also [UA Risk Management](#) website.]

## What do I need to do before class begins in May 2014?

Read through the material provided for you in this document. Ask questions of the instructor, department, and university if you are unclear about any aspect of the course; we will ask you to complete a liability waiver in May 2014 indicating that you understand the risks inherent in a field course of this nature. Gather together the gear and supplies you will need. Get/stay in shape. Do your background reading and prepare two short presentations described on first page of this document. Access the D2L course website. Be sure you are officially registered and have paid both tuition and the course activity fee. Find your valid passport or other appropriate border-crossing documents. Pack appropriately, but not excessively.

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