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### ENVS 104A: Introduction to Environmental Field Methods

This course introduces you to the start-to-finish process of field science. We will cover a range of field skills and methods in ecology, but our emphasis is on how they fit into the larger process of conducting investigations to guide conservation, restoration, management, and basic scientific understanding. At the end of this course you will be familiar with the scientific method; development of strong research and monitoring questions; study design; data collection, exploration, analysis; and the interpretation and communication of findings. You will know some natural history and have the tools to learn and record more. You will have the basic tools to evaluate other research and monitoring efforts in detail.

*This is a hard course.*

You need a working knowledge of statistics; a willingness to work hard both in the field and at your desk; and the time to read, participate in long field outings, and work in groups with your peers on several assignments. **You MUST consistently attend class. If you foresee any difficulties attending class (such as our trip to the intertidal on July 3<sup>rd</sup> at 6 am) please let Josie know on the first day of class/ASAP to discuss alternatives.**

*This is also a fun and rewarding course.*

You will get to know each other, get dirty, spend time in beautiful places, and learn!

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**Instructor:** Josie Lesage  
Email: jclesage@ucsc.edu  
Office: Natural Sciences 2, rm 469

**Office hours:** Mo 12:30p - 1:30p  
Tu 2:00p - 3:00p

#### Meeting Locations & Times

**Meeting times:** Mondays 9:00 am – 12:30 pm

Wednesdays 9:00 am – 12:30 pm, 1:00 pm – 4:00 pm

**Primary classroom:** ISB 221

**Labs:** Various locations (see schedule)

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#### Important dates – Summer Session 1

ADD deadline: Thursday, June 27<sup>th</sup>

DROP deadline: Monday, July 1<sup>st</sup> (tuition reversed)

Change grade option: Friday, July 5<sup>th</sup>

Withdrawal deadline: Friday, July 12<sup>th</sup> (no tuition reversed)

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#### Required Texts

All required readings will be available online through the class Canvas webpage. You are also required to have a field notebook (see description below).

#### Attendance policy (15%)

Regular attendance is required to be successful in this class. Occasional tardiness will be excused, but absences and consistent tardiness will result in a low attendance grade (-40 points for each unexcused absence). If you need to miss class, talk to Josie beforehand to arrange alternative assignments.

**Field Journals (30%)**

Naturalists have kept field journals for centuries. For this course, you will keep a field journal to build your observation, natural history, and recording skills and to build a durable record of your field activities and observations this quarter. There should be an entry in your journal for every trip you make into the field, whether it is a part of this course or not. For a journal, we recommend a bound book (not spiral bound) of modest size (~5x7"), blank or dotted paper, with a durable cover. Good options include Art Alternatives black bound books (available at *Palace Art* downtown), or – if you want waterproof paper for inclement conditions or aquatic work – ‘Rite in the Rain’ notebooks (mail order and a little pricy).

- Include a table of contents at the start of your journal.
  - Number the pages of your journal.
  - Date every entry with month, date, and year (all 4 digits), and record time of day.
  - Briefly describe the location you are writing about and the weather or other variable conditions near the top of the page. Your objective is to record date and location information in the most detailed, least ambiguous way possible so that you and others can know exactly when, where, and under what conditions your work was done.
  - Write your notes directly into your field notebook in the field. Use good paper and permanent, dark ink (pencils OK but less optimal). Josie is a fan of “pigma micron plastic nib archival ink pens” (they come in a variety of colors for illustration, and are available at *Palace Art*). Sharpie pens with "ultra fine" points and the "uni-ball vision micro," made by Sanford, with waterproof/fade-proof ink are also good options.
  - Take digital photos of your field notes so that you have an electronic version as well – it would stink to misplace your notebook and lose all of your irreplaceable descriptions of your observations. Your journal should be turned in on Monday, July 22<sup>nd</sup> so that I can return them to you before the end of the quarter. Because maintenance of your journal is a daily responsibility, late journals will not be accepted. I will grade your journal on accuracy, format, clarity, completeness, neatness, and attention to detail.
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**Field Trips**

First and foremost, this class will emphasize hands-on research, monitoring, and reporting. We will visit several at field sites, including Younger Lagoon, the Campus Reserves, and Fort Ord. We will leave on time for field trips from our designated meeting points. You cannot make up field exercises due to lateness or unexcused absence. It is a privilege to do research in the in the field and to be allowed to take advantage of our area’s natural laboratories. At times, we will be working in areas that are closed to the public. This means we have a few rules:

- The rangers/managers have the ultimate authority in the park. You must do whatever they tell you to. You may bring any problems you have with the rangers/managers to the instructor.
- Except for data, you may not collect ANYTHING inside the reserves (no shells, rocks, etc.)
- Being a student in this class does NOT give you permission to be in restricted park or reserve areas without the class, unless previously arranged.

**Some advice for working in the field**

A key to being able to assimilate information outdoors is comfort. Study in the field often requires that you be still for long periods of time, either quietly viewing the subject at hand, or quietly waiting for your subject to come into closer view.

- **Eat well before and during field trips, and bring water.** Don't hesitate to carry snacks with you. Peanuts, raisins, cheese, fresh or dried fruit, or chocolate are good choices. A quart-sized container

(or two!!) of water is essential.

- **Dress in layers**, so garments can be added or subtracted to maintain body temperature in cold, windy weather. A shirt and outer sweater (wool or fleece), along with a vest and/or windbreaker, make a good combination. You don't have to wear them all at once! Wear sturdy pants (shorts are often a disaster in the field and an easy way to get ticks or poison oak) and closed shoes with socks and some traction. Carry both a warm hat and a sun hat (e.g. baseball cap). For cold mornings, fingerless gloves and neck gaiters are splendid!
- **Bring sunscreen and chapstick.** Sunglasses add comfort on bright, sunny days.

**POISON OAK:** You can do a few things to minimize this problem. (1) Be able to identify it in all of its insidious forms. (2) Wear long pants and a long sleeve shirt if you are sensitive. (3) Get it off yourself as soon as possible. Your first line of defense is to rinse with COLD water as soon as possible, e.g. in a creek or the ocean. When you get home, use Tecnu as per the instructions. (4) After field trips, wash your field clothes – separately if you can – to get the oil out of your clothing.

**TICKS:** Ticks give you the chance to experience parasitism as well as practice the mutual grooming techniques you have seen other primates do in documentaries! The best prevention is to check for them periodically and especially in the shower post-field. Besides the obvious (e.g. arms and legs), check nooks and crannies: hairline, behind ears, neck/waist/bra/socklines, groin, armpits. If you find a tick that has not burrowed into your skin, remove it. We recommend crushing it to avoid re-boarding. If you have an “attached” tick, do not remove the body while leaving the head in your skin – you must gently twist and pull with tweezers to get the whole tick out and avoid infection risk. Ask those around you for help.

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### Things to bring on field days

- Field Notebook with pens and pencils
- Field project sampling gear
- Daypack
- Food and drink
- Watch: weatherproof and digital. Stopwatch function is also useful.
- Binoculars, if you can get your hands on some: used for LOTS of things.
- Field guides, if you have them – birds, plants are especially useful.

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### Research Equipment

We will be using a wide range of research equipment – from transect tapes to binoculars to computers. This only works if we all take responsibility for caring for it, and making sure it gets put back so that others can use it. Be conscientious. Also, it is common that equipment breaks or needs maintenance. I won't yell at you or charge you extra for breaking stuff (unless it's been gross negligence!). Don't put away a damaged or non-functional piece of equipment - let me know so that I can fix it or replace it.

### Computers and Data Analysis

Scientists and resource managers use computers. For this class you will need access to a computer with the following programs:

- Microsoft Office (Word, Excel, Powerpoint)
- JMP (a statistical analysis program, free to download for students at [its.ucsc.edu](http://its.ucsc.edu))
- *E-mail that you check on a regular basis*; crucial to class and group communication.

For data analysis workshops and other lecture events in the syllabus, it is crucial that you come to class prepared – with data entered and opened in JMP to confirm that the format is correct, readings done (including peer drafts), and presentations prepped and ready to load onto a presentation computer or emailed to Josie ahead of time. If you do not have access to a laptop or these programs, please let Josie know to discuss alternatives!

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### **Cell phones, tablets, etc.**

During class, I expect you to put away cell phones, iPads, etc. and set them to silent. You will survive this loss of contact, and chances are you will get to know the environment and your classmates better without them! However, phones can be an excellent way to take photos of interesting field observations, to keep track of GPS coordinates, and to coordinate meetings with group members. Therefore, I ask you to NOT use your cell phones on field trips to catch up on social media or check email. I DO recommend their use for taking notes, photos, and other field documentation, and obviously for emergency or logistical coordination reasons. If you want to post a great photo you took in the field to your social media, please do so! – just wait until after class is over. Also, be aware that in many field locations, cell phone coverage will be spotty or missing entirely.

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### **DRC Accommodations**

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student who qualifies for accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to Josie privately during my office hours or by appointment by the end of the first week. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at [drc@ucsc.edu](mailto:drc@ucsc.edu).

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### **Summer Counselling and Psychological Services Information**

The UC Santa Cruz Counselling and Psychological Services (CAPS) Center is available and open to continuing registered UCSC students all summer. As campus is quieter over summer, CAPS' services are more limited: they can provide crisis services, initial assessments, brief individual counseling, and referrals, and may also provide psychiatry (medication) services or couples counseling on a limited basis. Note that SHIP or other insurance is not needed to access services at CAPS (except for prescriptions)—the cost is covered by student fees. If you feel at any point that you would like to talk to someone or take advantage of one of these CAPS mental health resources, you call CAPS at (831) 459-2628. And, if at any point during the quarter you feel that your mental health is interfering with your ability to work productively, please let Josie know so that we can find a workable solution together.

### Class Conduct

Students are expected to adhere to the UCSC policy on academic integrity ([www.ue.ucsc.edu/academic\\_misconduct](http://www.ue.ucsc.edu/academic_misconduct)). Academic integrity is the cornerstone of a university education. Academic dishonesty diminishes the university as an institution and all members of the university community. All assignments should be written individually and be original works for this class.

All members of the UCSC community have an explicit responsibility to foster an environment of trust, honesty, fairness, respect, and responsibility. All members of the university community are expected to present as their original work only that which is truly their own. In the event a student is found in violation of the UCSC Academic Integrity policy, he or she may face both academic sanctions imposed by the instructor of record and disciplinary sanctions imposed either by the provost of his or her college or the Academic Tribunal convened to hear the case. Violations of the Academic Integrity policy can result in dismissal from the university and a permanent notation on a student's transcript.

All academic integrity violations (e.g. plagiarism, cheating, multiple submissions, facilitating dishonesty) will be prosecuted if encountered.

### Grading

| <i>Points Value</i> | <i>Activity</i>   |
|---------------------|---|
| 150                 | Attendance  |
| 100                 | Quizzes & Informal checks <ul style="list-style-type: none"> <li>• Various points per quiz/check</li> <li>• Scaled to 100 at the end of the session</li> </ul>  |
| 300                 | Field notebook  |
| 250                 | Assignments <ul style="list-style-type: none"> <li>• 75 pts Vegetation sampling (#1)</li> <li>• 75 pts Species Richness Project (#2)</li> <li>• 50 pts CRAM sampling (#3)</li> <li>• 25 pts Dichotomous key (#4)</li> <li>• TBD - 25 pts Norris Center questions (#5)</li> </ul>                                |
| 200                 | Final project: grant proposal <ul style="list-style-type: none"> <li>• 10 pts Preliminary question(s)</li> <li>• 20 pts Updated question online</li> <li>• 20 pts Comments on peer's questions</li> <li>• 40 pts Proposal outline</li> <li>• 70 pts Final paper</li> <li>• 40 pts Final presentation</li> </ul> |

Total Points: 1000

| Date     | Time               | Where to meet            | Readings due   | Assignments due  | Topic & Activities  | Notebook entry  |
|----------|--------------------|--------------------------|--|--|---|---|
| 6/24 (M) | 9:00 am - 12:30 pm | ISB 221                  |  |  | 1. Course introduction<br>2. First observations in field notebook<br>3. Intro to data, stats, & experimental design | X   |
| 6/26 (W) | 9:00 am - 4:00 pm  | Coastal Biology Building | Ambrose ch. 1-8, Elzinga ch. 12, Broman and Woo 2018                   | Have a field notebook<br>Download JMP to your computer                             | 1. Assign. 1 data collection, entry, analysis<br>2. Final project assignment introduction                           | X   |
| 6/28 (F) |                    | --                       |  |  |   |   |
| 7/01 (M) | 9:00 am - 12:30 pm | Coastal Biology Building |  | Proposal Q's due @ 9am<br>Updated Q's posted to canvas by midnight                 | 1. Peer Review of grant proposal Qs<br>2. Intro to assignment 2   | X<br>(shared entry for July 1 <sup>st</sup> & 3 <sup>rd</sup> ) |
| 7/03 (W) | 6:00 am - 1:00 pm  | Coastal Biology Building | Read abstract & intro of Gotelli and Colwell 2001                      |  | 1. Assignment 2 - species richness and posters  |   |
| 7/05 (F) | 5:00 PM            | --                       | Comment on 2 of your peers' questions, assign. 1 due online @ midnight |  |   |   |
| 7/08 (M) | 9:00 am - 12:30 pm | ISB 221                  | Gilbert et al. 2010  | Grant proposal outlines due in class @ 9am   | 1. Peer-review of grant proposal outline<br>2. Demos of methods on the FERP   | X   |
| 7/10 (W) | 9:00 am - 4:00 pm  | PetSmart Parking Lot     | CRAM readings + video  |  | 1. Assignment 3 - San Lorenzo River CRAM  | X   |
| 7/12 (F) | 5:00 PM            | --                       | Assign. 2 due online @ midnight  |  |   |   |
| 7/15 (M) | 9:00 am - 12:30 pm | Coastal Biology Building |  |  | Younger Lagoon Methods Blitz  | X   |
| 7/17 (W) | 9:00 am - 4:00 pm  | TBD                      |  |  | Fort Ord Methods Blitz  | X   |
| 7/19 (F) | 5:00 PM            | --                       | Assign. 3 due online @ midnight  |  |   |   |
| 7/22 (M) | 9:00 am - 12:30 pm | ISB 221                  | Skim Balding and Williams 2016   | Field notebooks due @ 9am<br>Draft final paper due @ 9am<br>Assign. 4 due in class | 1. Peer review of draft proposals<br>2. Course review trivia<br>3. Visit the Norris Center/Assign.45                |   |
| 7/24 (W) | 9:00 am - 4:00 pm  | ISB 221                  |  | Email presentation to Josie by 9am<br>Assign. 5 due in class                       | 1. Assignment 5 (Dich. Keys)<br>2. Final Project Presentations  |   |
| 7/26 (F) | 5:00 PM            | ---                      | Final paper due online @ midnight                                      |  |   |   |