

E-STEM Professional Development Course

Course Description:

Level: Intermediate, Class limit: 11, Lab Fee \$15

This course is designed particularly for students returning from the summer field geoscience course, however it is open to any students that are interested in broadening their professional network in Environmental STEM (E-STEM) fields, learning from local stakeholders about what “work” they complete in their career, and learning what skills and content knowledge is needed for different career paths. Each week a different E-STEM professional will engage with students both in the field (where appropriate) and in the classroom to give students a feel for what professionalism and professional work means for different jobs. Some of the local stakeholders will include professionals in fields such as environmental consulting, environmental policy, municipal planning, environmental education, energy and resource management, recreation, research, and conservation. Students will be evaluated based on their performance on weekly assignments, interaction with the weekly stakeholder, and a final project/report.

Prerequisite: students must have taken at least 2 ES courses prior to enrolling.

Course Goals:

- 1) Increase students’ awareness of and access to a broad group of professionals working in ESTEM fields
- 2) Provide opportunities for students to read and discuss scientific/technical literature and reports
- 3) Facilitate student understanding of potential pathways to future careers

Student Learning Goals:

- 1) Be comfortable and confident researching employment opportunities, preparing application material, and interfacing with professionals to inquire about potential or future opportunities.
- 2) Be able to describe different methods and needs for data management, report preparation, budgeting, communicating science to the public, and dissemination of research findings depending on career type.
- 3) Have a basic understanding for how to use common software important in many E-STEM jobs such as Microsoft Office, Adobe products, and ArcGIS.
- 4) Begin developing a confidence in reading and writing about scientific content to public and professional audiences.

Required Materials:

- Notebook and writing utensils
- Computer with access to Microsoft Office, Adobe Reader, ArcGIS, and the internet (all available in campus computer labs)

Expectations:

- I expect that you come to and show up on time to every class.
- You will inform me if you have to miss class for any reason and take the responsibility to get notes on the class material from a classmate, find out about any logistical

announcements from class (for example, a changed due date), and arrange a time to meet with me to go over anything you do not understand.

- If you miss a field trip, there is nothing you can do to make up the experience, come talk to me about options.
- I expect that you will spend ~9 hours/week working on class-related work/reading in addition to the 6 hours/week of class time for a total of 150 hours/term.
- I expect that you will hand your work in on time (see policy on late work below).
- Please plan your term work schedule ahead of time. If you know of a conflict in advance, please come talk to me about it early.
- If you are having trouble with this course or other courses, feel free to come talk to me at any time for extra help. It is your responsibility to ask for help from the TA or myself.
- Your education is your own responsibility – I'm here to facilitate that experience.

Skills I expect you already have or know how to find out how to do them on your own:

I will not cover these skills in class, however you can always ask the TA or me for help (or other resources) outside of class time.

- Using the library and online databases
- Accessing the portal
- Checking your email ~daily
- Scanning documents
- Making multiple documents into a single PDF
- Reducing the file size of a PDF to <4MB so that it can be emailed easily
- Embedding a clear (not blurry) photo/drawing in a text document
- Using text editing tools in Adobe Reader and Word/Pages

How you will be evaluated: see below for details

Assignments: 40%

Written Project: 15%

Skills Project: 20%

Engagement/Participation: 10%

Career Portfolio: 15%

Weekly Schedule:

Reading assignments are posted for the week prior to when we will talk about the topic in class. Please complete the reading prior to coming to class (normally a pdf will be available on the portal).

Week 1: Skills, Content Knowledge, and ESTEM Careers Overview and Logistics of Job Acquisition

- **Activity:** Make a list of internship opportunities: list skills/content knowledge you will gain and write a bit about why they interest you?
- **Activity:** Develop list of entry level jobs making note of where they found the job advertisement. List skills/content knowledge required for the job, the logistics of the job, and the salary/benefits information.

Week 2: Science Education at the High School Level

- **Stakeholder:** High School Science Teacher(s) and Students.
- **Discussion:** Tailoring topics and assignments to standards (NGSS).
- **Activity:** Create mock assignment for a science topic of choice. Match the assignment to NGSS.
- Field Trip to a local site with the high school students and teachers. College students teach some aspect of the the field trip.

Week 3: Collaborative Research and Scientific Communication

- **Stakeholders:** Group of collaborators from local laboratory: biologists, computer programmer, program manager, volunteers working together on a community-significant project and citizen science projects.
- **Discussion:** Planning a project, writing a proposal, executing a collaborative project, communicating with different audiences.
- **Activity:** Data visualization techniques using citizen science dataset.
- **Field Trip:** Local Laboratory/Field Site of collaborative project

Week 4: Proposal Writing and Research Ethics, Concerns and Communication and Science Education to the Public

- **Stakeholders:** Communications Researcher, Institutional Review Board (IRB) member.
- **Discussion:** research ethics, IRB process.
- **Activity:** Prepare mock proposal for a scientific study of choice.
- Discussion of internships and jobs list. Follow-up activity: Prepare a CV and cover letter for an entry level job.

Week 5: Technical Skills - Illustrations and Graphics

- **Stakeholder:** Researcher to discuss illustration or visualization techniques.
- **Activity:** Build an illustration for proposal and follow-up illustration critique.

Week 5: Networks and Resource Management

- **Stakeholder:** Forest Ecologist, Resource Manager.
- **Field Trip:** local research site.

Week 6: Geology and GIS Work

- **Stakeholders:** Geological Survey employees - GIS, mapping, report writing, applied projects.
- **Activity:** Build a GIS-Based map of field area for proposal.
- **Activity:** Interview mentor in community and write response.

- **Field Trip:** Conference attendance.

Week 7: Private Sector and Public Health

- **Stakeholders:** Environmental Consulting workers, local biological/environmental laboratory.
- **Field Trip/Discussion:** Local sites of interest or readings picked by stakeholders.
- **Activity:** Oral presentation on skills project progress.

Week 8: Recreation and Graduate School

- **Panel of Stakeholders:** National Park (or other recreational area) employees - research, program management, public safety, cultural resources, etc.
- **Field Trip:** Local sites of interest tied to recreation site.
- **Activity:** Peer review of draft of written project.
- **Discussion:** graduate and post-graduate research opportunities.

Week 9: Municipal and State Government

- **Panel:** Local and regional government workers with ties to geoscience (Dept. of Env. Protection, Center for Disease Control, etc.).
- **Field Trip:** Geoscience Education Conference (Optional).
- **Activity:** Peer review of Career Portfolio.

Week 10: Final Presentations

- Presentation of skills projects.

Policy on Late Work

Making deadlines is important. I understand things come up and we can't always make everything on time. If you think you are not going to make a deadline, come talk to me! However, there must be some consequences for tardy work – thus, the policy is, for every day the assignment is late, you lose 20% from the overall assignment grade. This is better than a zero! I will not accept an assignment after it is 5 days late. **YOU CAN ALWAYS SUBMIT LATE WORK TO ME BY EMAIL OR BY HAND IN MY OFFICE** (do not leave your work under the door or in my mailbox) – there is no excuse for not being able to submit work.

Policy on Academic Integrity:

The short version:

Cheating, plagiarizing, falsely portraying others' ideas – these things are very bad and not tolerated at COA. I am VERY serious about this. Please be sure to review what is and what isn't plagiarism. Misconduct will result in failure of the assignment and disciplinary action.

The longer version:

Please show respect for others, including your fellow classmates, colleagues, and other Academics/Educators. This means being honest in completing your own work on homework, tests, projects – everything. It is very important that your work be truly your own work. Mostly because it is important that YOU learn! But, it also is universally considered misconduct to take others' ideas/words/creations as your own. In the event of academic misconduct, the incident will be reported to the Academic Dean with potential consequences ranging from failure of an assignment to dismissal from COA.

We will often work in teams. I encourage you to discuss ideas with your classmates. But when you turn in work or present an idea, it must be in your words. Please always give credit where credit is due (if it isn't your idea – say whose idea it is! It's not just wording, it's the idea as well.)

This is both to protect you and to protect the original author. If you aren't sure, please ask me and also consult the Academic Handbook and other resources listed below.

Some resources for understanding plagiarism (it's not easy, check it out):

- 1) COA library website: <http://www.coa.edu/libraryguideplagiarism.htm>
- 2) Examples of what IS and what ISN'T plagiarism from Charleston Southern University: <http://www.csuniv.edu/library/Plagiarism/common.htm>
- 3) Harvard's website about plagiarism, especially check out the bit about "mosaic plagiarism":
http://usingsources.fas.harvard.edu/icb/icb.do?keyword=k70847&pageid=icb.page342054#a_icb_pagecontent732741_mosaic

Come talk to me:

If you have or experience during the term any specific learning needs, anxiety, death in the family, illness, or anything that prevents you from attending class and completing work, please come talk to me. I do not need to know all of the details, but this is the only way I will be informed of an issue and the only way I might be able to accommodate you in some way. I'm usually in my office, but best if you email first to set up an appointment time.

More info on how you will be evaluated:

Career Portfolio (15%): After each stakeholders' visit you will record an entry into your career portfolio (will discuss in week 1). This will be a log of what you learned about the skills, training, content knowledge required for different career paths, but will also include information about characteristics of different jobs (amount of time in the field/lab, day-to-day work, workplace dynamics, travel, etc.) You will do one for each visitor, plus 3 additional with other community stakeholders of your choosing for a total of at least 15 entries.

Homework (40%): Throughout the term you will have short assignments designed to teach or help you practice a skill or concept. Some of the assignments will directly benefit or can be tailored to enhance one of your two final projects. Overall there will be ~6 assignment (listed on syllabus)

Final Written Project (15%): Throughout the term you will work on preparing a written project that will benefit you beyond this class. This may be something you are working on anyway: grant proposal, scholarship application, senior project proposal, independent study report, a paper for your writing portfolio OR it can be something new! It must include these items: at least

5 written pages, references (with at least 5 scientific papers cited and a mix of other resources), at least 1 figure/diagram, it must deal with a scientific topic, and it cannot be submitted (as is) to another class for a grade (although you can use a version of this product to submit to a grant agency, COA archives or a committee for review, the writing center, etc.)

Final Skills Project (10% Presentation, 10% Materials): Find some environmental scientific work that needs to be done, a mentor to help you, and that will teach you a NEW skill and/or content knowledge. I have some ideas (listed below), or you can pitch your own to me. There must be a short written portion, some illustrative portion (map or figures), and a communication portion (your presentation in class). You might do field work, lab work, teaching, calculating – it is up to you to decide which skill(s) and content knowledge to practice.

Participation (5% Engagement with Visitors, 5% ANPSS): We will meet with many “stakeholders” this term. I expect you to be prepared to engage with them – both as members of a class and individually as time allows. There is not a set number of questions you should ask, etc., but if you do not interact with the stakeholders, this will be reflected in your grade. We will also help to organize the Acadia National Park Science Symposium. You will help plan/run the meeting as well as attend the meeting on Oct 20 at COA!