Interested in Joining the Simpson Lab?

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Commitment to Diversity, Equity and Inclusion (DEI)

We firmly believe that a diverse lab helps us to answer complex problems in ways that exceed contemporary expectations. The Simpson lab is committed to having students from all backgrounds and hopes to augment our own continuous learning of DEI with the knowledge gained from newcomers.

Approach to Advising

This is Professor Simpsons approach to advising:

1. In terms of courses taken throughout your training, I would like to learn about your interests and the courses that you find most helpful for you as you transition into your career. We should discuss your courses before you enroll so that your class experiences are suitable for your research and your long term career goals.

2. In terms of dissertation, it is my responsibility to coordinate what research topic is suitable for a well rounded body of work. I believe that this is good advisor-advisee practice since the quality of your research is a direct reflection of my ability to train you. We will have multiple discussions to navigate each research project in your dissertation and you will have ample opportunities to voice your concerns throughout your training. Building a dissertation is dynamic.

3. When selecting your dissertation reading committee we will have discussions about who is most suitable for your body of work. I expect you to suggest names, however I may have other suggestions to assist in gaining the highest level of recognition for your body of work in the general field.

4. We will have biweekly lab meetings and biweekly literature review meetings (i.e., we will alternate lab meetings where you display your research progress to the general lab in one week with a literature review of a specific research article or learning a new general skill in the following week).

5. We will have biweekly one-on-one meetings on literature review meeting weeks where we will discuss research progress or career planning one-on-one.

6. We will have biweekly progress reports where you document figures and or analysis of data.

7. I am a jovial person and I care about your wellbeing. As an advisor I do not believe that we must be friends to produce great work. However it may happen that we naturally become friendly. I would like our group to feel family oriented. We do unto others as we would like to be treated and we care about everyone's success. There are no favorites in the Simpson lab.

8. I have a hands-on approach to advising. If there are any difficulties in the lab or any questions that you need assistance in answering, please feel free to contact me for help. There are no questions that will get me upset. I am willing to be in the lab to help you troubleshoot. I have an open door policy, if the door is open come in at any time. Otherwise, if the door is closed I am likely in a virtual meeting or away from the office.

9. I am not your only mentor, you must find a panel of mentors to help you through this marathon. As an exercise, I will challenge you to find mentors that fit the following categories:
    a. A Postdoc or Senior PhD student in the School of Engineering that emulates what you'd like to become when you reach their level of seniority
    b. A full professor in the School of Engineering that you can agree to meet with regularly for career advice. I will assist you in making this connection and formulating an email.
    c. A person who currently has the career you would like to have in the future that you can meet with once a semester to ensure that you are gaining the experiences you need to achieve that career in the next set of years. I will assist you in making this connection and formulating an email.

    This exercise is mandatory for all students in the Simpson lab. We will document these people. We may have to send multiple emails so find alternates for each. **This will be completed by the begining of the Fall Semester of your 2nd year.**

10. Writing research papers is collaborative. We will write in increments of 2 paragraphs for each research paper. Writing will be fun.

11. Research articles will be submitted to journals that best fit the research topic.

12. Research will be presented at conferences. In general we will attend the following conferences:
    a. Gordon Research Conference (GRC) Environmental Sciences: Water (**Senior Students have Priority**)

b. Gordon Research Conferences (GRC) Water Disinfection Byproducts and Health (**Relevant Research Priority**)
c. American Chemical Society (ACS) Conferences
d. Association of Environmental Engineering and Sciences Professors (AEESP) Conferences

NB It may happen that the lab is low on funding and certain conferences are out of reach. I will try my best to find as many resources as possible to fund your attendance. Generally students with publishable research will be allowed to attend conferences.

13. I am directly responsible for funding your research. However, it is in your best interest to apply for external funding too. These external funding opportunities help to show your achievements on a national level and help to boost your CV.

14. I will do my part in introducing you to professors outside of USC to help in growing your network.

    Please contact me if you have concerns.

Skill building

Being able to discern the story that raw data tells is the ultimate goal of a PhD. We obtain our PhDs to learn how to learn, thus skill building never ends as an academic. In the Simpson lab we learn, document, and standardize methodologies. Here are some expectations on how we learn how to learn:

1. Incoming PhD/Master's students will be onboarded by Professor Simpson, and a senior team member in the lab. Professor Simpson will read this expectation document with the new member and ensure that all areas of necessary clarification are met. The document will be signed.
2. A great portion of research in the lab involves method development–which is an iterative process whereby we optimize lab workups and analytical techniques to detect analytes in our samples of interest. Thus all lab members are required to author at least one Standard Operating Procedure (SOP) or to optimize past SOP(s) to better the work of researchers in the future. These SOPs will be documented and available on our lab OneDrive.
3. Administrative tasks keep the lab functioning. Therefore researchers will be designated a general administrative task each year to assist in lab duties. These tasks include:
    a. Group meeting/location coordination and scheduling
    b. Safety training coordinator
    c. Lab Cleaning coordinator
    d. Fun activity Czar

4. We will have multiple instruments that need regular attendance in the lab. All senior researchers will be incharge of one instrument with newer students shadowing that senior researcher. Responsibilities for these senior researchers include:
    a. Purchasing materials for maintenance of the instrument
    b. Keeping instrument logbooks up to date
    c. Pursuing maintenance procedures to ensure the sensitivity, and accuracy of the instrument (NB for instruments that require delicate care we may sometimes have to refer to a certified technician; the researcher in charge will have to discuss with Professor Simpson and the group in group meetings about soliciting the technician).
    d. Teaching newer students how to maintain the instrument
5. To ensure that students keep track of their projects well they will be required to keep a progress report. Progress reports will be updated biweekly on the off weeks from lab meetings.

Administrative

PhD Timeline

The Start

Students with a BS:

- For incoming students with a BS, it is generally accepted that your PhD can be completed in 5-6 years.

Students with an MS:

- For incoming students having already completed their MS, it is generally accepted that your PhD can be completed in 3-4 years.

The Progression

Taking courses, research, writing and working as a teaching assistant are all integral parts of being a PhD student. There are expectations for the quantity and quality of work for you to be in good standing amongst your peers. Here are minimum requirements for you to be amongst the top of your peers:

- **First year:**
    - **Literature review:** To have a solid background to pursue research. In general readings will be more difficult and students will have to research definitions of jargon. Students should aim to read more ‘Review’ articles than technical papers at this point. It gets better with time so do not give up. By the Summer of your first year, you should be able to grasp 90% of a publication.
    - **Courses:** You will be taking two courses per non-Summer semester.

    - **Publication**: Professor Simpson may ask you to assist in writing a perspective in your first year. However, most students do not publish as first author in their first year.
    - **Conferences:** Most students in their first year do not attend conferences unless otherwise notified.
- **Second year:**
    - **Literature review:** Students should have received a clearly defined project for the Summer semester of their first year. By the start of their second year, much effort will be placed on planning the blueprint of your dissertation. Thus literature review focus will be narrowed down to a clearly defined scope of papers and emphasis should be placed on technical papers to gather key facts and methodologies.
    - **Courses:** You will be taking two courses per non-Summer semester.
    - **Publication**: Being second author or co-first author on a publication is within reach.
    - **Conferences:** Students are expected to attend their first conference at this time.
- **Third year:**
    - **Literature review:** Students should be working on their first publication as a first author. Literature is used to ensure that they are up to date on key findings in their field and to search for new methodologies.
    - **Courses:** You will be taking two courses per non-Summer semesters.
    - **Publication**: By the end of the year you should have submitted or published a first author publication (**1st paper for dissertation**)
    - **Conferences:** Students are expected to attend their second conference at this time.
- **Fourth year:**
    - **Literature review:** Literature is used to ensure that they are up to date on key findings in their field and to search for new methodologies.
    - **Courses:** You will be taking two courses per non-Summer semester.
    - **Publication**: By the end of the year you should have submitted or published a first author publication (**2nd paper for dissertation**)
    - **Conferences:** Students are expected to attend their third conference at this time. **Students need to be aware of future PIs for Postdocs and keep a running list of potential fit. Collaborate with Professor Simpson to assist in making connections. If academia is not to your liking, begin job hunting. Major consulting firms like McKinsey and Boston Consulting Group recruit a year in advanced.**
- **Fifth year:**
    - **Literature review:** Literature is used to ensure that they are up to date on key findings in their field and to search for new methodologies. Students will be expected to focus on writing their dissertation at the end of the year. **Students will also be asked to consider the next steps in their career.**
    - **Courses:** You will be taking two courses per non-Summer semesters. **Special interest in fullfining departmental requirements**

    - **Publication**: By the end of the year you should have submitted or published a first author publications (**3rd paper for dissertation**)
    - **Conferences:** Students are expected to attend their fourth conference at this time.
- **Sixth year:**
    - Most students should be finishing up the final stages of their PhD. An end date should be clearly defined with an ending outcome agreed upon between Professor Simpson and the student.

Each student's experience is different and thus timelines may differ.

Funding

With the new unionization of graduate students I am not sure of the negotiated stipend and benefits. However, applying for and receiving external funding is not only celebrated in the lab, but also recognized very well externally. Securing funding for your PhD or Postdoc is considered a great boost to your CV. I highly encourage students that fit the criteria to apply for the National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP), and or the Ford Foundation Fellowship.

Course Selection

MS Courses

For incoming students that have not obtained their MS, course selection will be slightly less flexible due to departmental needs. You can read more about the requirements here.

As of **August 11th, 2023**, all students are required to complete **28 units**. Specific requirements include:

- Achieving a minimum 3.0 GPA to graduate
- Taking the two Core Courses:
    - ENE 505 *Energy and Environment* - 4 units (Fall)
    - ENE 512 *Environmental Fluid Mechanics* - 4 units (Spring)
- Choose a concentration:
    - Water Track - **All students in the Simpson Lab should take the water track**
        - ENE 562 *Aquatic and Environmental Chemistry* - 4 units (**NB** course offered every other fall - i.e., Fall 2022, Fall 2024)
        - CE 523 *Physicochemical Processes in Environmental Engineering* - 4 units (Fall)
        - CE 553 *Biological Processes in Environmental Engineering* - 4 units (Fall)
        - Air Choice:
            - Pick any of ENE 428, 426, 527, or 535.
    - *You must take **CE 485** *Water and Wastewater Design* if you have not taken the course or its equivalent as an undergraduate

- Remaining 4 units:
    - Speak with Professor Simpson about the best course choice if you have taken an equivalent to CE 485 already. Approved electives include:
        - CE 451 *Water Resources Engineering* (Spring)
        - ***CE 485** *Water and Wastewater Design* (Fall)
        - CE 503 *Microbiology for Environmental Engineers* (Spring - **Recommended**)
        - CE 516 *Geohydrology*
        - CE 599 *Complex Systems Safety and Resiliency* (offered intermittently)
        - ENE 428 *Air Pollution Fundamentals* (Spring)
        - ENE 502 *Environmental and Regulatory Compliance* (Spring)
        - ENE 510 *Water Quality Management and Practice* (Spring)
        - Other Electives Approved by Advisor here are some options (I am open to discuss others, bring a syllabus):
            - CHEM 423L *Advanced Laboratory Techniques in Organic and Inorganic Chemistry* (Spring) (**highly recommend)**
            - CHEM 426 *Advanced Organic Chemistry* (Fall) (**highly recommend)**
            - MATH 542L *Analysis of Variance and Regression* (**highly recommend)**
            - BISC 435 *Advanced Biochemistry* (Spring)
            - ENGR 502x *Writing Skills for Engineering PhD students* (**highly recommend)**
            - ENGR 503x *Oral Communication Skills for Engineering PhD students* **(highly recommend)**
            - ENGR 410 *Social Media for Engineers and Scientists*

Mentorship and Outreach

- Students will be required to serve as teaching assistants (TA) on average once per academic year if they are not on fellowship.
- It is encouraged for students to mentor at least one undergraduate students for a semester during their PhD
- Outreach is also encouraged in a field that is valued by the student. Professor Simpson will use outreach activities as a talking point when you apply for jobs at the end of your PhD.

Name of student:_____

Signature: _____

Date: _____

Professor Simpson's Signature: _____

Date: _____