Office of Undergraduate Research & Creative Activities
UNIVERSITY OF COLORADO DENVER

EURēCA! Student Assistant Mentoring Plans and Contracts

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Tips for a Quality Mentoring Plan

A research mentor is someone who can provide feedback, support, and structured goal-setting to move students forward as researchers. Mentors can help student researchers engage in research and scholarly activity, grow in an understanding of their field, and provide experience relevant for future professional goals. With guidance from their mentors, students can engage in key elements of research and scholarship, learning to distinguish between personal beliefs and evidence, as well as to situate the concepts, practices, and results of their work within a broader context.

Click here to access some of our favorite publications addressing the importance of mentorship in undergraduate research.

A quality mentoring plan is key to encourage structure and growth for emerging scholars. Below are some examples of previous EURēCA! mentoring plans and co-written mentoring contracts.

View example mentoring contract template here.

1. Example Faculty Mentoring Plans

1. It will be the faculty mentor's responsibility to keep the project on track and moving forward. Many of the things we do in laboratory-based research do not work initially, requiring troubleshooting. While this is a completely normal part of the process, many students get frustrated if things don't work the first time. A big part of the faculty mentor's role is to help students overcome this mental barrier and learn to troubleshoot for themselves. This is accomplished by having the student understand all the aspects of their experiment, and why certain conditions are used. With this basic knowledge, they can now begin to adjust and optimize conditions that will eventually lead to success.

2. The Mentor and mentee will meet once a week to discuss the progress of the project. If problems arise or any step of the project hasn't been working, we will troubleshoot together to figure out how to go forward. Success will be measured by whether the milestones of the specific plan described in the project proposal are being met. The preferred method for communicating will be in person for daily meetings and updates. A PRA can also help if the main faculty mentor is unavailable. And if necessary, email is a perfectly good means of communication.

3. Trainees have individual one-on-one meetings with the faculty mentor to check in about research progress, timelines, and goals. Meetings are 15-20 min for undergraduate RAs. Undergraduate RAs and new MS RAs also meet with a PhD co-mentor weekly for 30 min. At the beginning of each semester, the faculty mentor has longer meetings with each trainee to discuss progress and upcoming goals. At the end of each semester, the faculty mentor will another one-on-one extended meeting to discuss performance over the semester. In preparation for these meeting, students fill out a reflection assessing their strengths, weaknesses, accomplishments, goals, and ideas for how they, the team, and the faculty mentor can improve. During the meeting, the trainee and mentor discuss the student's reflection and a progress report for them where the mentor assess their performance including in general, disseminating work (e.g. presentations and writing), understanding of the science, ability to work independently and in a team, and using technology. Additionally, the team connects virtually through email and slack to answer questions and keep projects moving in between meetings.

4. The faculty mentor and co-mentor will provide oversight and guidance to the mentee in the lab. The student will be onsite 10-12 hours per week and will submit a bi-weekly activity report via e-mail or Microsoft Teams chat. The mentor and co-mentor will provide feedback regularly so that the student may adjust their performance and grow professionally. The faculty mentor and co-mentor will encourage professional and academic development of the mentee as an aspiring scientist. The student will learn technical skills essential for immunology research as well as general good laboratory practices and research ethics. The co-mentor will work alongside the student, teaching skills and scientific concepts, and helping the student gain independence at the bench. The faculty mentor will meet at least once weekly to review project progress, troubleshoot, and guide intellectual development. She will also review written and oral reports, providing verbal and written feedback.

2. Example Co-Written Physics Mentoring Contract

1. **What are the main responsibilities of the undergraduate researcher in this project (including hours)?** The main responsibilities of the undergraduate researchers will be to perform a literature review, generate input data, perform tests calculations, perform full production calculations, data collection, data analysis, creating high-quality graphs, and produce a short piece of technical writing describing the results they have generated, and the process they used to generate them.

2. **What are the responsibilities of the mentor in this research project? What skills will the mentor teach the mentee?** The main responsibilities of the mentor will be to oversee the work of the undergraduate researcher, and provide them with access to the knowledge and skills they need to be successful in their research project, and in their future career. This could include, but is not limited to, guidance on how to conduct literature reviews, suggestions on how to optimize calculations, coding advice, tutorials on creating scientific visualizations and scientific writing, and identifying the cross-over between these skills and potential future careers where they would be useful. The undergraduate researcher would like to pursue a future career involving quantum physics, and so the mentor will help them identify opportunities in this field.

3. **What are the expectations for the project? What is the timeline for completing the key components of the research project? How will you measure progress**? The timeline and key components of the research project are outlined in the Gantt chart below. Progress will be measured by the completion of each of the major components, along with the relevant description, figures, and / or files to be included in the final technical write-up. The mentor and mentee will aim to work to this timeline, but both understand that research often does not happen according to schedule, and are committed to adapting to any required schedule changes.

3. **In what form and how often will the undergraduate researcher document and report their research work to the mentor?** The undergraduate researcher will prepare a small set of slides, to be presented at the weekly meeting, to document their progress. These will contain important text descriptions of how to perform calculations, diagram, and graphs. At the end of each major milestone the researcher will create a formal write-up of their progress, and collate any important files and figures, to be included in their technical write-up. They will also provide verbal progress updates at the ad-hoc informal meetings.

4. **Describe the measurable final product(s) that will serve as the goal(s) for this project (data set, research paper, presentation, article, etc.)?** Measurable outcomes include a Literature Review, which will include references to the most current literature on our research topic and adequate summaries of each paper, a set of input data and calculation parameters which can be used to reproduce these calculations, results files from the production-run calculations, data analysis scripts and final processed data, and

graphs generated from the latter. Most of these will be contained within a final technical report, which can then form the basis of conference presentations or research articles to be completed in the academic year 23-24.

5. **What expectations does the mentee have of the mentor?** Replying to emails or messages promptly, being available for meetings, providing career advice, building a support system.

6. **What expectations does the mentor have of the mentee?** Replying to emails or messages promptly, being willing to ask questions / ask for clarification, being available for meetings.

7. **What type of assistance does the mentee want from the mentor in achieving their career goals during their time working together? Where does the mentee hope their career will have taken them in five years**? The mentee hopes to be employed in a position that frequently uses their physics knowledge and research skills, but is not necessarily a "physics" job. This could be in the fields of health, or computer science. The main assistance the mentee has requested is to set up a network, i.e. make them aware of and put them in touch with people who have physics degrees but work in other fields.

8. **How often will you meet? When and where? For how long?** We will have regularly scheduled weekly meetings, one hour in duration. These will be held in the mentor's office. We will also meet on an informal basis 2-3 times per week to give each other progress reports, and as needed depending on the current stage of the project (e.g. to improve programming skills).

9. **Who will be responsible for scheduling the meetings?** The mentor will schedule all regular meetings, but the mentee can schedule meetings as needed. Informal meetings will occur several times per week.

10. **What will meeting topics include?** Meeting topics will include acquiring the fundamental physics knowledge necessary for this research, research tools such as conducting literature reviews and performing data analysis, computational skills including python programming and high-performance computing, soft skills such as presenting research and technical writing, and job-seeking skills focusing on setting up professional networks and finding job opportunities.

11. **What will be the ground rules for discussions? (E.g., confidentiality, openness, truthfulness, etc.)** Discussions between the mentor and mentee should be honest and generous, seeking to find common understanding and a collaborative approach to any identified issues. They should have a positive tone where possible, and extend grace towards each other, by assuming that all questions and comments are sincere, with the desire of increasing both participants' knowledge. While the research topic is unlikely to

generate any confidential material, in relation to personal matters (job seeking) both will communicate what they would wish to remain confidential, and whether that request can be accommodated.

12. **In what form and how often will the mentor provide constructive feedback to the mentee?** The mentor will provide regular casual constructive feedback verbally, during informal meetings. During the formal weekly meetings, at the appropriate milestones, the instructor will provide written constructive feedback, in the form of comments on pieces of writing or graphs, comments in pieces of computer code, and also written comments preserved via email in relation to current progress or suggested directions of research. The mentor will always strive to deliver feedback in the most positive way possible.

13. **If problems arise, how will they be resolved?** Problems will be resolved with open and honest dialogue from both parties, with a focus on listening to each other, and an "us vs the problem" attitude. If a situation arises where either party feels uncomfortable participating in such a dialogue, the Chair of the Physics department will act as a mediator.

14. **Any concerns the mentee wants discussed and resolved?** None – the mentor and mentee have worked together for the past 6 months, and have a good working relationship.

15. **Any concerns the mentors want discussed and resolved?** None – the mentor and mentee have worked together for the past 6 months, and have a good working relationship.

16. **We have agreed that our initial meetings will focus on these three topics:**
    a. Review of this contract and "ground rules" for research.
    b. Performing a Literature Review – where to find relevant research articles?
    c. Initial exploration of local physics-related employers

17. **Any additional areas/issues you want to discuss and agree to?** None.

3. Example Biology Lab Mentoring Contract

Welcome to the lab. Here, we study (focus of biology research). We work in a collaborative setting with people from a variety of backgrounds and education levels. We are always learning, improving, and pushing ourselves and others to be our best. In doing so, we produce first-class research for the broader community. This document lays out the **Lab expectations** and your **mentoring plan**. Please read it carefully, let me know if you have any questions, and when everything is clear send me a signed copy of this file.

Lab Expectations

Mentor's Responsibilities.

- I will do my best to help you become an exceptional researcher and to help you achieve your goals whether they be in academia or industry or other.
- I will provide honest and constructive feedback and thoughtful advice.
- I will do my best to provide a supportive, productive, and collaborative work environment.
- I will strive to set high and achievable research goals pushing the team to always improve.

Team Expectations.

- Take care of your mental and physical health
- Commit to first-class rigorous and reproducible research
- Respect yourself and others
- Show up on time
- Be organized. Pay close attention to the protocols we follow, and procedures for collecting, processing, and archiving data. I expect you to record data in our lab's Team's account (see details below) and clearly label experiments and data files according to the research protocols. I also expect you to notify me when supplies are low
- Ask questions! Asking questions is an important part of the research process. You can ask me questions in person or through email. It is always better to ask questions than it is to move forward without knowing the answers and running the risk of making mistakes
- Report any issues or mistakes. Also, we can all make mistakes (including me!) and it helps the team knowing when they happen so we can quickly mitigate consequences
- Communicate early and often about any personal or professional concerns you have about the research or research team. Early detection of problems is always preferable, as it can save a lot of time, energy, and money.
- Be a contributing and collaborative member of the team
    - Work through issues or conflicts with other team members should they arise
    - Communicate with me and others in the team
    - Respond to emails in a timely manner (e.g. ~24 hours) unless on vacation or emergencies; expected responses include confirmation of receiving the email. I expect all members of the research team to respond to all emails in a professional manner

- Help make our group inclusive and welcoming to all people (e.g. all races, ethnicities, genders, sexual orientation, age, background, religion)

Lab Meetings. Lab meetings will be weekly. It is the expectation that research assistants attend each lab meeting. During lab meetings, we will connect as a team, set goals and timelines, practice communicating our research, and discuss primary literature. You will be expected to deliver a progress report (a short presentation on the work you have completed). Please contact me if you have a conflict and will be unable to make a meeting or 1to1; at least 24 hours' notice is expected when possible.

Expected Time Commitment. A sufficient and regular time commitment to the research in the lab is necessary both to move forward the science and for the research assistant to have a beneficial research experience. As such, unless otherwise discussed with mentor, research assistants are expected to schedule 10-15 in person hours/week to work on the project.

Lab Microsoft Teams account: You will be given access to our Teams account, where all information regarding protocols, experiments, and lab meeting is stored. You are expected to record your work in Teams on a weekly basis and update the lab calendar with the hours you worked. It is expected that you will be working on the project during your scheduled times. If you need to work on something else (e.g. homework), please update your schedule.

Weekly check-ins. Research assistants will attend weekly or bi-weekly check ins with mentor. Assistants will come to these check-ins prepared with an update (in writing) on what they did the previous week, what the plans are for the upcoming week, and questions. It is expected that assistants will have at least one question. It is also expected that assistants will learn to lead their one-to-ones guiding the flow of the meeting.

Work time. It is expected that research assistants will write their GOAL and UPDATES on Teams at the beginning and end of their work time respectively. This helps to coordinate between people working and make sure that people are not unknowingly working on the same task. It is expected that assistants will check Teams to see what others are working on and will communicate often with others.

Health and Wellbeing. Health and wellbeing are absolutely essential to a productive team and, most importantly, researcher. Health and wellbeing includes physical, mental, and emotional well-being. Remember that sufficient sleep is necessary too! It is my expectation that research assistants will seek help and resources as needed including talking with me, and others in the team as comfortable. CU Denver has free counseling and other resources (http://www.ucdenver.edu/life/services/counseling-center/about/Pages/default.aspx?gclid=CjwKCAjwqZPrBRBnEiwAmNJsNv60cgOz09d3OdftzaH734eIdMLvSxpVmYAfcBqmNKEDp8DX-uV2-RoCrgIQAvD_BwE). I and the rest of the team are committed to supporting the health and wellbeing of our team members. We will identify the best way forward to accommodate people.

I have read, understand, and agree to the Lab Expectations written above.
Sign Below