EURēCA! Work-Study Program
Student Handbook

A program of the Office of Undergraduate Research and Creative Activities with
support from the Office of the Provost and involving collaboration with the Financial Aid
and Scholarships Office, Experiential Learning Center, and Career Center
| Fall 2020 |

Note: This EURēCA! Work-Study Program Handbook is intended to provide an overview
of this program and to summarize policies described in detail in the University of Colorado
Denver | Anschutz Student Employment Handbook, published annually by the Student
Employment Office. All on-campus University employers should read, be familiar with,
and adhere to policies described in detail in the University of Colorado Denver | Anschutz
Student Employment Handbook in addition to this program overview document. Every
student should also be familiar with the Student Employment Handbook, in particular, the
sections on Student Employee Information and Policy.
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Welcome Students and Faculty!

Thank you for your interest in the EURēCA! Work-Study Program. This is one of several Education through Undergraduate Research and Creative Activities (EURēCA!) programs run by the Office of Undergraduate Research and Creative Activities, all of which are designed to provide CU Denver students an opportunity to engage in educational collaborations with faculty mentors. The EURēCA! Work-Study Program, specifically, facilitates the use of Federal Work-study by qualified undergraduates to pursue professionally relevant paid research opportunities at CU Denver | Anschutz, either for- or not-for-credit.

Students, we are excited that CU Denver is able to offer you a variety of exciting opportunities to engage in mentored learning outside of the classroom. Take this time to learn to conduct original scholarship in your field, develop a professional relationship with a faculty mentor, immerse yourself in your discipline, explore academic and career options, follow your passion, and have fun!

Faculty, help us to introduce students to scholarship in your discipline, challenge our students by engaging them in professionally relevant and meaningful scholarly activities, and support them as they disseminate their findings to broader audiences. Ideally, participating in one or more of our EURēCA! Programs will advance your scholarship as well, as it has for many faculty members across our schools and colleges.

We are here to provide support as you navigate the process of joining our community of scholars and mentors. Please do not hesitate to contact our office with questions about this or other EURēCA! Programs. We are here to support you!

Sincerely,

Erin Golden, PhD
Director of Undergraduate Research and Creative Activities
https://www.ucdenver.edu/lynxconnect/undergraduate-research
undergrad.research@ucdenver.edu
What is the Office of Undergraduate Research and Creative Activities?

The Office of Undergraduate Research and Creative Activities (URCA) provides CU Denver | Anschutz students the opportunity to connect with the research and creative mission of the University. Our Education through Undergraduate Research and Creative Activities (EURēCA!) programs facilitate collaboration between students and faculty to incorporate inquiry, design, investigation and discovery into learning experiences outside of the classroom.

In addition to the EURēCA! Work-Study Program, URCA also runs the EURēCA! Summer Fellows Program, the Undergraduate Research Opportunities Program (UROP), and organizes the annual Research and Creative Activities Symposium (RaCAS). Our office also provides advising services to CU Denver undergraduates interested in accessing mentored learning opportunities across the CU Denver | Anschutz campuses.

The URCA Team:

Erin Golden, PhD
Director
erin.golden@ucdenver.edu

Liz Evans
Undergraduate Research Advisor
elizabeth.evans@ucdenver.edu

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The EURēCA! Work-Study Program
Why Should Students Participate?

As Colorado’s premier public urban research university, CU Denver offers a wealth of learning opportunities both inside and outside of the classroom. Here, undergraduates are building 3D printers, creating documentary films, developing new techniques to detect cancer, and participating in an exciting world of discovery – all while being paid and receiving academic credit!

The EURēCA! Work-Study program helps match qualified undergraduates – those with a Work-Study Award as part of their Financial Aid Package – with faculty mentors who are eager to engage them in research and creative scholarship. Through these collaborations, students have the opportunity to make a meaningful contribution to their field, while learning skills needed to succeed in a professional setting. Starting salary is $14/hour and you can choose to apply this experience towards a for-credit internship as well.

Why participate? Besides receiving hands-on training not generally available through traditional undergraduate curricula1, a recent study found that CU Denver undergraduates who utilize their work-study awards have higher graduation and retention rates, as well as increased success at obtaining jobs after graduation2.

From science labs, to field sites, to studios – undergraduate research experiences can happen in a variety of settings and take on many forms. Curious about the experiences available to you? Reach out to the Office of Undergraduate Research and Creative Activities (undergrad.research@ucdenver.edu) or search for EURReCA! positions on Handshake.

Unsure if you have a Work-Study Award as part of your Financial Aid Package? Contact the Financial Aid & Scholarships Office: FinancialAid@ucdenver.edu

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**Student as Scholar, What Does that Mean?**

The term **scholar** denotes a person with a deep and profound knowledge of a specific subject. Whereas all scholars are students, not all students become scholars. One key differentiator in this process is **mentorship**. EURēCA! Work-Study students are not employees, they are EURēCA! Mentees. Through this experience you can expect to be given individualized training from your mentor as they introduce you to the world of scholarship in their discipline.

**Across studies, students report that the most important aspect of the undergraduate research experience is their relationship with a mentor**³

- Students participating in the EURēCA! Work-Study Program can expect to be intellectually engaged by their EURēCA! Mentor. Under their guidance, students will learn what it means to be a scholar and come to understand the importance of scholarship to society.

- EURēCA! Mentees can expect to develop both discipline-specific and universal career skills. They will learn the techniques and methodologies needed to address relevant questions in their field as well as develop more general professional skills. These include creativity, judgement, communication, organization, and persistence, among others.⁴

- With guidance from their mentors, students will 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.

- Students will learn to communicate and disseminate their work to a variety of audiences. From one-on-one meetings to participation in the annual Research and Creative Activities Symposium (RaCAS), students will learn to coherently share their research and ideas.

- Students will receive guidance as they plan their future careers. Mentors will help students understand what is needed to become a professional in their discipline and aid in setting goals and milestones. The Office of Undergraduate Research and Creative Activities is here to help students connect with additional training opportunities.

- EURēCA! Mentees should seek to develop an authentic relationship with their mentor. Communication is key to this dynamic. Just as you are depending on your mentor to train you as a scholar, know that they are depending on you to complete

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an aspect of their own scholarship. Set expectations early, hold yourself accountable, and work together to come up with a plan for how you will communicate and resolve challenges.

- Research and scholarship are challenging, but we know you can do it! The Office of Undergraduate Research and Creative Activities is here to help you connect with resources that will set you up for success: undergrad.research@ucdenver.edu
Who is Eligible to be a EURēCA! Work-Study Mentee?

To be eligible to hold a EURēCA! Work-Study position, a student must:

- hold degree-seeking CU Denver undergraduate status;
- submit a Free Application for Federal Student Aid (FAFSA) and receive a work-study award as part of their financial aid package;
- complete a University of Colorado Background Request Form, pursuant to the CU Denver | Anschutz Background Investigations Policy;
- be enrolled part-time or full-time (at least 6 credit hours) throughout the semester, including summer semesters (see CU Denver | Anschutz Student Employment Handbook for details);
- maintain Satisfactory Academic Progress assessed at the end of each semester based upon grade point average, completion rate, and overall attempted credit hour limit;
- have relevant coursework and demonstrated skills, which will vary with the proposed scholarly activity;
- commit to presenting outcomes of scholarly activity at the CU Denver Research and Creative Activities Symposium (RaCAS), held each spring.
Application and Hiring Process

How Do I Apply for a EURēCA! Work-Study Job?

Obtaining a EURēCA! Work-Study position is a competitive process. Furthermore, it represents a real commitment to students by faculty members. As such, receiving a Work-Study Award as part of your Federal Student Aid does not guarantee a position. Start the search for a work-study position early to maximize your chances for success.

To find available EURēCA! Work-Study positions:

1. Submit your current FAFSA application and contact the Financial Aid & Scholarships Office concerning your work-study eligibility: FinancialAid@ucdenver.edu
2. EURēCA! job postings can be viewed on Handshake, the University of Colorado Denver’s student employment platform (https://ucdenver.joinhandshake.com/).
3. From the homepage select ‘Jobs’ in the top middle column.
4. Search "EURēCA!” in the search bar.
5. Read the job titles and descriptions to find opportunities relevant to your area of study and career goals. Make sure you review the expectations and qualifications required for each position. Job descriptions will have the name and information of the faculty contact (EURēCA! Mentor); don’t hesitate to reach out to them for more information about the position.
6. Once you have found one or more jobs you want to apply to, read through the EURēCA! Work-study Online Presentation and complete the Quiz at the end.
7. After passing the online quiz, you will be notified by email that the label “eurecaok” is on your Handshake account by the Undergraduate Research Advisor (elizabeth.evans@ucdenver.edu). This is not an automatic process so allow 1-2 business days. You cannot begin applying until you have this label associated with your Handshake account.
8. Contact the Undergraduate Research Advisor before applying to answer any questions about the program and to ensure that your application materials (i.e., resume, cover letter, transcript, work-study award letter) are appropriate to the position. You can also use drop-in hours with the LynxConnect Peer Advisors or set up an appointment with the Career Counseling Staff to review your application materials. All advising appointments can be scheduled via Handshake.
9. Submit a complete application (incomplete applications will not be reviewed). Faculty mentors will reach out to schedule interviews with qualified candidates.
10. Apply early! While positions may be posted well before the start of a semester, the deadline for filling these positions is two weeks into the semester.
The Hiring Process

1. Once offered a position, you will work with the Undergraduate Research Advisor, Liz Evans, to finalize your hiring.

2. You will need to complete a Student Experience Learning Agreement (aka. Experience) on Handshake before you are legally allowed to begin working. This document will be finalized during a Solidify Appointment with the Undergraduate Research Advisor. Together you will confirm your job description and role, set learning objectives for the semester, and review expectations of the EURēCA! Work-Study program.

3. Once your Experience document is complete, it will be sent to your faculty mentor and the Student Employment Office for approval.

4. Students with an established university employee ID number typically do not need to complete a background check or I-9 verification in order to begin working. Students who do not have a university employee ID number will work with Mary Baitinger (mary.baitinger@ucdenver.edu) to complete the background check and I-9 work eligibility verification process.

5. The Fall 2020 hiring deadline for EURēCA! Work-Study Mentees is September 2, 2020.

Employment Requirements

All student employees MUST:

- complete the University of Colorado Background Request Form, pursuant to the University of Colorado Denver | Anschutz Background Investigations Policy;

- complete all relevant University trainings required to undertake the scholarly activity, which will vary depending on the scholarly activity;

- complete an I-9 form;

- be enrolled at least part-time (at least 6 credit hours per semester). Students who drop below the 6-credit hour requirement, or withdraw during the semester, may only work through the last day of attendance;

- enroll in a “for-credit” or “not-for-credit” internship through a Handshake Experience during the semester in which the award is administered. Failure to do so will result in the Work-Study Award being withheld.

Work-Study student employees who are graduating may only work up to the last day of classes and/or finals week and may not earn Work-Study funding past the last day of classes. Please Note: if you have graduated, you are not considered a current student and therefore, are not eligible for student employment.
If you have questions regarding any of the above, please contact your Undergraduate Research Advisor, faculty mentor, and/or the Office of Financial Aid.

General Requirements

Students hired as part of the EURēCA! Work-Study Program represent the Office of Undergraduate Research and the University of Colorado Denver. As such, EURēCA! Mentees are ambassadors for this Program and are expected to conduct themselves in a professional manner.

- **Work-Study Positions are Real Jobs!**
  
  Your faculty mentor is counting on you to be there when you are scheduled. Much of lab work consists of precise timing or sequential work among various individuals. Consistent lateness or missing work may lead to termination.

  If you have an unexpected emergency, contact and inform your supervisor so that adjustments can be made.

- **Work-Study Does Not Mean Studying During Work**

  During your scheduled hours, you are there to work. Most faculty mentors recognize that student employees are juggling an academic schedule, a work schedule, and personal responsibilities. Each student employee and mentor should plan a work schedule that best accommodates classroom hours and study time. Students are not able to schedule work-study hours during their regularly scheduled class times. When discussing your work schedule, be sure to leave time outside of work hours for studying.

- **Satisfactory Academic Progress**

  Federal and State financial aid rules and regulations require that students maintain Satisfactory Academic Progress (SAP), in order to be eligible to earn their Work-Study awards. This progress is assessed at the end of each semester and is based upon grade point average, completion rate, and overall attempted credit hour limit. See the CU Denver | Anschutz Student Employment Handbook for details.

- **Unprofessional behavior on the job must be avoided.**

  This includes dressing inappropriately, cell phone use, unpreparedness, and threatening language and behavior. Use the appearance, behavior, and practices of others in your work environment as a guide. If you have any questions about what is appropriate behavior, ask your mentor.
Hours

EURēCA! Work-Study Mentees can receive an award totaling up to $3,000 per semester, but no more than specified as part of their Financial Aid Package.

Once all hiring paperwork in Handshake and with HR has been completed, Student Researchers may begin working, but not before so. Students may work and report up to 25 hours per week or 50 hours per biweekly pay period during the Fall and Spring semesters. During Winter, Spring, and Summer Breaks, students may work up to 40 hours per week. Students may not work more than eight hours in one day and must take a 30-minute break when working six or more hours.

Schedule Setting

Students must arrange a mutually agreeable work schedule with their mentor or direct supervisor and adhere to it. Each student employee must:

- arrange a work schedule that does not interfere with their class schedule, including final and midterm exams, during which supervisors are required to accommodate the student’s study/exam schedule;
- follow the schedule once it has been established. Notify their supervisor if there is an unexpected change;
- be punctual;
- provide prior notification to supervisor of inability to report for scheduled work hours.

Students cannot be paid for hours worked when it is determined that they should have been attending class during that time.

Timesheets and Pay Periods

Timesheets are completed through the online MyLeave system.

Time reports are due to your faculty mentor on the Friday before the pay period ending date unless you have made other arrangements with your mentor. ALL time reports received after 10 am on Monday following the pay period ending date may not be processed until the next payroll.

Resignations and Terminations

Students should give a notification of at least two weeks if planning to resign from their Work-Study Student Research job prior to the end of the semester.

A student’s continued employment is contingent upon satisfactory performance as determined by their mentor in consultation with their direct supervisor. If the mentor
decides that a student’s performance is not satisfactory, the student may be dismissed following appropriate steps detailed above. Student employees may write a letter of appeal to be placed in their student employment file.

If they knowingly submit fraudulent information, students will be dismissed from the program and may face legal consequences.
Additional Information

Contact the following for detailed information about the EURēCA! Work-Study Program:

- **Dr. Erin Golden**, Director of Undergraduate Research and Creative Activities  
  Phone: 303-315-5028  
  Email: Erin.Golden@ucdenver.edu  
  Location: LynxConnect, Tivoli 439

- **Liz Evans**: For-credit and not-for-credit undergraduate research advising  
  Phone: 303-315-4000  
  e-Mail: elizabeth.evans@ucdenver.edu  
  Location: LynxConnect, Tivoli 439

- **Financial Aid and Scholarships Office**: Work-study awards and hiring  
  Phone: 303-315-1850  
  Email: Financialaid@ucdenver.edu  
  Location: CU Student Commons Building, Suite 5105

- **LynxConnect**: Resume and cover letter assistance, trainings, and workshops  
  Phone: 303-315-4000  
  Email: LynxConnect@ucdenver.edu

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**Federal Work Study and FAFSA Information**

The Office of Financial Aid and Scholarships at CU Denver offers opportunities for Student employment on campus. To learn more and apply for positions begin by logging into UCDAccess, clicking the **Financial Aid** tab then **Student Employment** which will link to the **Handshake Job Board**. More information about Handshake can be found within this student guide.

To be considered for a Federal Work-Study Award at the University of Colorado Denver, you should complete the Free Application for Federal Student Aid (FAFSA) through the **FAFSA website**. **Priority Deadline is April 1st and online applications must be submitted by June 30th!** If you are initially not awarded Federal Work-Study as part of your aid package, reach out to the Office of Financial Aid and Scholarships and complete a Work Study Request Form. If you are subsequently awarded a Federal Work-Study award, you will receive a revised award notification.

**Questions?** Visit the Office of Financial Aid and Scholarships in Suite 5105 on the fifth floor of the Student Commons Building between 8:00 a.m. and 5:00 p.m. Monday-Friday. You can also contact the office by phone at 303-315-1850 or email at Financialaid@ucdenver.edu.
Five Essential Skills for Every Undergraduate Researcher

Research is hardly easy. As Martin Schwartz points out in his 2008 essay “The Importance of Stupidity in Scientific Research,” solving research problems requires us to immerse ourselves in the unknown. However intimidating it may be to overcome this infinite amount of ignorance, we believe there is a special set of traits that will equip an undergraduate researcher to successfully solve research problems. Creativity, judgment, communication, organization, and persistence are all equally important skills to make the leap from gaining knowledge from others’ discoveries to making discoveries on your own. Having and honing these skills, skills that encompass every level of research in every discipline, are key to an undergraduate developing the foundation for a successful career in research. As a group of undergraduate researchers and mentors, we want to motivate students to solve problems and make discoveries, and to start a discussion on how to forge the right path for each student toward research success. Following is our list of key skills.

Creativity
It is difficult to find a definition of undergraduate research that does not include a reference to creativity or that does not contain terms such as original, authentic, or unique. Clearly, then, creativity is a constant for the undergraduate research process. In an article by Jeffrey M. Osborn, dean of The College of New Jersey, and Kerry K. Karukstis, professor of chemistry at Harvey Mudd College, originality is said to be a “common thread that runs through every undergraduate research activity on campus.” Creativity and originality go hand in hand. Creativity is the ability to transcend mainstream ideas, and creativity all but requires originality. It is no surprise then that originality is so pervasive throughout the college or university campus. The Council of Undergraduate Research provides a universally applicable definition that describes undergraduate research as “an inquiry or investigation conducted by an undergraduate student that makes an original, intellectual, or creative contribution to the discipline” (Wenzel 1997, 2000). All researchers, not just undergraduates, require creative thinking and process development to build upon today’s knowledge. Creativity is an essential trait that undergraduate researchers should seek to develop and utilize within their research experience.

The first step in research is developing a topic or a plan for exploring a problem, and creativity is fundamental to this effort. As members of our university’s Student Undergraduate Research Council, we constantly come across prospective undergraduate researchers who don’t know where to begin. Students in all disciplines are unsure, even lost, as to how they should start deciding upon a research topic. We encourage students to research their discipline extensively, to find out what has and has not been studied, and to attempt to find a topic in which they are genuinely interested. Even by studying research outside their own disciplines, budding researchers can use the creative process to make new connections, pushing the envelope of what is possible in discovery. Ingenuity, uniqueness, and, most importantly, creativity are all skills that need to be applied in creating that standout research concept.

Students who are still hesitant about delving into the creative process of undergraduate research as part of an independent endeavor should seek to develop their creativity by participating in ongoing research and watching how a faculty mentor or graduate student employs creativity in conducting that research. During this time, undergraduate researchers can learn how to think creatively within the context of their field and possibly discover a topic of interest that will provide them with an independent, unique research opportunity. But students should not limit themselves to the expertise of their faculty mentors. To be a true researcher, undergraduates should strive to reach beyond their own disciplines, either into closely related disciplines or those completely unrelated to their own, for possible ideas.

Judgment
A quite specific sort of judgment is critical when participating in the world of research. Just as the mentor may exercise judgment in selecting a mentee, an undergraduate researcher should likewise evaluate and choose a mentor who will help the researcher to grow in the best possible way. Personality,
temperament, and style of research are all factors to consider when choosing a mentor. Another important aspect of judgment is recognizing when to ask for help in solving problems. To gain the most experience from research, students must make a calculation between knowing when to ask for help when they encounter an obstacle or possibly lose time by deciding to tackle the problem on their own. The progress of the research and perhaps the opportunity for the project to be finished successfully may rest on what they decide.

However, student researchers should not over-utilize a mentor’s valuable time; instead, they should strike a balance between independence and seeking assistance. As undergraduate researchers move on to higher-level studies and professional careers, this ability to discern their own and others’ needs, and thus make judgments in a fluid environment, must become automatic and unconscious, so they do not waste precious time and energy weighing the pros and cons of every single decision.

Undergraduate researchers also should consider and study the importance of good judgment as it applies to ethical dilemmas in research. Failure to exercise good ethical judgments can seriously jeopardize the careers and integrity of not only the student researchers, but also of their mentors, colleagues, and possibly even their college or university. Undergraduate researchers must be careful not to rely solely on the examples set by faculty mentors or fellow students. Additionally, students should spend ample time learning about the ethical issues associated with their particular fields and strive to utilize their own considered judgments to arrive at appropriate, safe, and ethical conclusions. Today’s undergraduate researchers should be cognizant of and conversant with common areas of ethical failings, such as misuse and misrepresentation of findings, wrongful disclosure, and even plagiarism. Being aware of potential ethical issues will help to maintain the integrity of the research for all parties involved.

Although it may be difficult to always make the best choices in an unpredictable world as research, undergraduate researchers have the opportunity to develop ethical and rational decision-making skills in a lower-stakes environment with oversight by experienced researchers. They can, through practical application, gain experience in making ethical judgments. They can learn to recognize the issue at hand (whether it be time conflicts or personality conflicts or something else); determine the pros and cons of each possible way of dealing with the conflict; seek advice from veterans of research; and, when appropriate, take the occasional risk. Studying these different types of decision-making processes (Bennis et al. 2010, 191) can help students develop the skills in exercising judgment that undergraduate researchers require. Eventually the skills should become second nature.

Communication
For this article, we refer to communication as the set of skills necessary to develop and maintain an effective relationship between an undergraduate researcher and his or her faculty mentor. The importance of a mentee-mentor relationship to all undergraduate students is best characterized by UCLA’s Alexander Astin, who counts these interactions as one of the most important factors in the development of a student’s undergraduate experience (Astin 1991). The positive implications of these relationships extend to undergraduate research as well, because these interactions “potentially have the longest-lasting impact” on the undergraduate researcher’s personal growth and academic development (Malachowski 1996, 90). Faculty mentors are the most valuable link between the student and the new and unfamiliar world of research. Mitchell Malachowski, in his discussion of the importance of faculty mentors to research projects, states they “encourage and guide the student’s personal growth and academic development, while providing support and assistance as the student works through the challenges” of undergraduate research (Malachowski 1996, 90).

Initiating communication with a faculty mentor during the early phases of the undergraduate research process can be an intimidating situation; students sometimes begin the process with faculty members with whom they have little experience. They may be hesitant to contact mentors outside of the predetermined research time at first, worried that their questions could be “annoying” or their concerns “silly.” However, in our experience, mentors are more than willing to accommodate students with in-person meetings and email exchanges, or to suggest the use of more-experienced student researchers as “peer mentors” for inexperienced undergraduate researchers.

Nonetheless, undergraduate researchers should be respectful of their mentors and their time; faculty mentors often balance a schedule consisting of multiple courses, their own independent research endeavors, and mentoring of additional undergraduate or graduate researchers. In our experience as undergraduate researchers, however, we have found that the creation and maintenance of productive relationships with our mentors have led to an increased understanding and knowledge of our respective fields, additional research opportunities, and overall enhanced personal and professional skills.

Organization
Well-honed organizational skills facilitate effective research and good science, as well as allowing students to balance classes, studying, research, socializing, hobbies, and maintaining a healthy lifestyle much easier. Keeping an organized
Dear Mentors/Professors: Tips to Maximize Research Value from Your Undergraduate Research Assistants

Jasmine Mah, University of Ottawa, jmah080@uottawa.ca

It is a common misconception that success as an undergraduate researcher depends solely on the student’s initiative, hard work, and dedication. The contributions of the supervisor in the student-mentor relationship, however, are equally crucial in promoting efficient and sustained undergraduate research (UR).

As a participant in the University of Ottawa’s Undergraduate Research Opportunity Program, I was enticed into research by an amazing professor who is not only renowned in his field, but also is able to enthusiastically communicate and transfer his knowledge. While research has been the most intellectually stimulating and useful opportunity of my university career, I soon discovered that many of my peers did not feel the same way about their experiences. In discussion with my fellow researchers, it became apparent that the supervisor’s involvement is the key to success. Drawing on my colleagues’ experiences, I present a few simple tips for UR mentors that will benefit faculty members’ work and improve the accomplishments of their UR assistants.

• Schedule regular meetings with your undergraduate researcher. This gives you a chance to check progress, answer questions, and minimize potential miscommunication concerning your research.

• Communicate your research in layman’s term. Explaining the bottom line and importance of your research motivates your undergraduate assistant by providing an overall goal to achieve.

• Establish networking opportunities by introducing your student to colleagues and graduate students. Your researcher will gather resources, develop partnerships between projects, and maximize the return received from the student’s investment in your research projects.

• Express your energy, enthusiasm, and interest. Passionate leadership results in passionate results!

• Mutual respect is a two-way street. Although undergraduates are at the bottom of research hierarchy, consideration and kindness encourage devotion and loyalty on the part of both parties.

• Provide resources for your undergraduate researcher. It is surprising how much a designated workspace or computer will encourage work in the lab.

• Be available to your undergraduate researcher. Professors will often shift the mentorship role onto graduate students. While a graduate student provides a great resource, the faculty member must also be available to teach and directly guide the undergraduate researchers.

Perhaps the real secret of any successful endeavor is communication!
of progress, and we often learn more from our mistakes than our successes, especially in research, where the investigator must consider many aspects of a problem. Many students pass up an opportunity to do research if there is a chance they might not succeed. Mistakes should be embraced as an opportunity to learn, and students should stop harboring a fear of failure. Although it is difficult to remain persistent at times, students must remember that it will pay off in the end, in the form of quality data, a solid synthesis, or even simply an educational experience.

Persistence is especially useful for budding undergraduate researchers who do not have strong resumes or previous experience. It’s a trait definitely noticed by most faculty mentors. Sometimes, a faculty mentor will pick a student for his or her lab even though the student has less experience than other candidates simply because the student has displayed strong motivation. Later, when a student is committed to research, persistence is essential to developing and carrying out a thorough project. Students who overcome roadblocks successfully by being diligent in reading the research literature and making use of their faculty mentor’s expertise will find that when it comes time to present their work, answering questions is effortless because the students have put in the foundational work. Persistence becomes an increasingly integral part of the research process as student researchers progress to graduate school and future academic endeavors. The majority of researchers must write several grants in order to initiate their research. This process inevitably involves rejection and, therefore, the motivation to rewrite and edit grant applications is crucial to launching the research process and a productive research career.

Conclusion
Applying the five skills outlined above will help an undergraduate transition from being a student to becoming a researcher and move from learning to discovering. Although we come from various backgrounds and research fields and have different personalities, we have found that these skills are common to all of our successes, from attending conferences on human factors in psychology, to writing a thesis on Italian architecture, to restoring oyster reefs, and even to studying molecular genetics in Germany. Creativity, judgment, communication, organization, and persistence are universally applicable in the pursuit of becoming a better researcher. We hope that this set of essential skills will provide a foundation not only for what it means to be an undergraduate researcher, but also will create the opportunity for a dialogue among researchers at all levels, from the undergraduate to the tenured professor, regarding what makes undergraduate researchers truly succeed.

References


Adrienne Showman
University of Central Florida, adrienne.s@knights.ucf.edu

Adrienne Showman is a senior pursuing her bachelor’s of science in molecular biology and microbiology at the University of Central Florida. Having worked in a biochemistry and X-ray crystallography lab for the past year and a half, her research interests include molecular biology and structure determination. She spent a summer abroad in Germany, working at Humboldt University in the Breeding Biology and Molecular Genetics Department through the German Academic Exchange Service: Research Internships in Science and Engineering Program (DAAD RISE). She hopes to pursue a PhD in biochemistry, and enjoys hiking, traveling, and mentoring outside of class and lab work.

Linh Anh Cat is a junior studying environmental studies and biology at the University of Central Florida. She has worked on oyster reef restoration and monitoring at the National Canaveral Seashore and is currently working on investigating the effects of invasive snails and aquatic plants on ecosystems. She has led volunteer trips to the Florida Keys to help create habitats for endangered species and to remove exotic species. Cat also educates high-school students about sustainability and guides them in creating new initiatives for their schools. She enjoys scuba diving, triathlons, and other outdoor activities in her free time.

Jacquelyn Cook is currently a senior pursuing her BS in psychology at the University of Central Florida. She has been working on human-robot trust research at the MIT2 lab since the spring of 2011 and has also assisted in team research at the Institute of Simulation and Training at the University of Central Florida since fall 2011. Her primary research interests include human factors psychology, team processes, and leadership. Cook plans to pursue a PhD in industrial/organizational psychology. In her free time, she enjoys playing video games and writing.
Natalie Holloway is a senior at the University of Central Florida, double majoring in art history and anthropology. She is currently in her second semester of undergraduate research, in which she is evaluating the influence geography has on 17th century Baroque Italian architecture. Her primary research interests are the Renaissance and Baroque periods of Italian art and architecture. Natalie plans to pursue a PhD in art history or museum studies and pursue a career either as director of a museum’s cultural education program or a university professor.

Tyler Wittman is a senior pursuing his degree in biology at the University of Central Florida. He has worked in an evolutionary biology lab for the last year studying the antagonistic coevolution of reproductive and immune systems. He plans to pursue a PhD in evolutionary biology; his primary research interests are the evolution of eusociality and immune systems. He enjoys weightlifting, biking, fishing and hiking in his free time.

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