Getting Involved in Undergraduate Research

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Undergraduate Research (UR) Overview

- Definition and examples
- Benefits for the university, professors and students
- Practical considerations
- Types of opportunities
- Steps to take now
Undergraduate Research (UR)

• Original research, creative project or activity
  • Design
  • Performance arts
  • Critical analysis of primary or secondary sources
  • Scientific investigations in social, physical, and biological sciences
• Done in each division and major
Benefits for the University & Researcher

- Student participation
- Training the next generation
- Students’ assistance and perspective
- Help secure grant funding
Benefits for Students

• Interacting with your professor one-on-one
• Participate in the university community
• Engage in the practice of your discipline
• Create knowledge, not just consume
• Complement coursework
• Help for graduate school or a job
• Career exploration
• Develop important traits: creativity, curiosity, ability to focus, verbal and written fluency, and respect for others’ contributions
Interests, Goals, & Practical Issues

- What classes/topics inspire you?
- What career involves your interests?
  - Does it require research experience?
- What practical issues are there?
  - Do you have the time?
  - Do you need transportation?
  - Do you need credits or to be paid?
Types of UR Opportunities

• Courses
• Positions with a professor
• Organized programs
UR in Courses

• Benefits
  • Less intimidating to get involved
  • Plan ahead
  • Know eligibility requirements

• Examples
  • Forest Ecology Research Plot
  • Computer Science & Computer Engineering Corporate Sponsored Projects
  • Psychology 194- Advanced Research
Characteristics of Positions

- Usually negotiated directly with a professor
- Highly variable
  - Eligibility requirements
  - Volunteer, for credit, or paid
  - Flexibility
  - Timing
- Varies by discipline
  - STEM and Psychology: often supervised by a graduate student in a research group
  - Social Sciences and Humanities: often Independent Study
Steps to Find a Position

• Step 1. Identify a professor
  • Classes
  • Students, TAs, other professors
  • List of professor’s research interests
  • Don’t overlook industry, non-profits, government

• Step 2. Do background preparation
  • Read websites carefully
  • Try to read a few publications
  • You are not expected to understand it all!
Steps to Find a Position

• Step 3. Contact the professor/researcher
• E-mail
  • Be formal (Dear Dr. or Professor)
  • Be specific to group (refer to paper, webpage, etc.)
  • Explain why research is critical for your goals
  • Have correct spelling and grammar
  • Don’t use emoticons
  • Don’t take a lack or response personally
Steps to Find a Position

• Step 3. Contact the professor/researcher
• Go to office hours
  • Go right after a test
  • Be considerate
  • Schedule an appointment if the professor is busy
• Show genuine interest
• Ask about research and for advice
• Ask how to prepare to join in the future
Characteristics of Programs

- Multiple students
- A formal application/evaluation process
  - Often require reference letters, essays, and transcripts
- Specific time period
- Extra activities and/or benefits
  - May involve placement with a professor
  - Stipend, research expenses, and travel and housing (in summer)
- Presentation opportunities
Finding a Program

• Networking
  • Undergrads, graduate students, TAs, professors
  • Ask at ACE, MEP, advisers

• Web resources
  • Professional organization websites
  • National student groups
  • Databases
  • Lists

Pathways to Science
Science, Technology, Engineering, and Mathematics
Applying to a Program

• Confirm you are eligible
  • May include: major, college, citizenship, GPA, year, EOP or transfer status
• Check the start date
• Contact the coordinator with questions
Applying to a Program (cont.)

• Fill out application completely
  • All requested information
  • Curriculum Vitae (CV) or resume
  • A personal statement
  • Reference letters often need to be from professors, not TAs
• Review by others for grammar, style, relevance, etc.
• Submit it on time
• RELAX!!
UCSC Programs of Interest
All Disciplines

• Merrill, Porter and Crown College Research Fellowships
• UCDC- UC Washington Center
• UCCS- UC Center at Sacramento
UCSC Programs of Interest
Social Science & Humanities

- Humanities Undergraduate Research Awards (HUGRA)
- Pathways to Research (EOP students)
- Research Mentoring Institute (RMI)
  - Any aspect of the human genome
UCSC Programs of Interest

STEM

- STEM Diversity Programs
  - 1-2 years
  - Programs involve research, graduate school preparation, tutoring, journal club, social activities and more
  - Due in February
- Research Mentoring Institute (RMI) for working on any aspect of the human genome
  - Rolling deadline
Physical and Biological Sciences Division

Undergraduate Research in Physical and Biological Sciences

Select one of the topics below:
- Preparing for Undergraduate Research
- Finding a Research Opportunity
- Join a Lab or Research Group
- Funding Your Research
- Presentation Opportunities—where and when
- Communicating Your Results—posters and papers
- Student Organizations

Finding a Research Opportunity
Finding a research opportunity is a process that will take a considerable amount of time and commitment. The suggestions below may help.

http://ugr.ucsc.edu/PbSci
Social Sciences Division

Social Sciences Undergraduate Research

In keeping with the University of California's three-part mission: research, teaching, and public service, the Division of Social Sciences has a strong history of integrating undergraduates into the research endeavor. (from Social Science Research)

For an example of Undergraduate Research in History, see the profile of Lois Rosson.

Select one of the topics below:
- Finding a Research Opportunity
- Join a Lab or Research Group
- Funding Your Research
- Presentation Opportunities
- Communicating Your Research—posters and papers
- Student Organizations

http://ugr.ucsc.edu/Social_Science
Undergraduate Research Opportunities Database

UCSC, regional, federal and selected multi-site programs.
Also see Other Research Opportunities

Filter by Program Name  Filter by Description, Keyword, or Contact
Major(s)
- Anthropology
- Applied Physics
- Art
- Biochemistry and Molecular Biology
- Bioengineering
- Bioinformatics
- Biology
- Business Management Economics

Hold shift (PC) or command (Mac) to select multiple majors. If no majors are selected, then all programs are displayed.

Search  Reset

Water Teaching and Research Laboratory: WaterLab
University of California, Washington Center (UCDC)
University of California Leadership Excellence through Advanced Degree
University of California Center Sacramento (UCCS)

http://ugr.ucsc.edu/database
Other Research Opportunities

Please note that we cannot guarantee the accuracy of the information on the sites.

Select one of the following topics:
- Databases & Lists that Include UR Positions
- Federal Agency Programs
- Additional Programs (cross-discipline)
- STEM Summer Schools

Databases & Internship Lists

Databases
- Pathways to Science
- UCSC Undergraduate Research Opportunities Database

Lists that include UR positions
- Opportunities Listing from UC Irvine
- Arts, Biomedical Sciences, Engineering, Computer Science, and Applied Sciences, Humanities, Physical Sciences, Social and Behavioral Sciences and Other
- Chisme Special Edition: Professional Opportunities 2014 (includes STEM, social sciences & humanities)
- STEM Binder of summer programs from the UCSC Career Center

http://ugr.ucsc.edu/other
Application Tips & Deadlines

Application Tips

- Help for every step of the process from Pathways to Science
- How to effectively obtain a letter of recommendation (from UCSC STEM Diversity)
- Getting strong letters of recommendation (from UC Berkeley)
- Writing a Curriculum Vitae (CV) (from UCSC STEM Diversity)
- Writing the Curriculum Vitae (from Purdue Owl Online Writing Lab)
- Writing the Personal Statement (from Purdue Owl Online Writing Lab)
- Writing Your Statement of Purpose (from UCSC CBSE Research Mentoring Institute)
- Summer Research– Applying and Getting in (from UCSC STEM Diversity)

Application Deadlines

January, 2014

- NASA Summer Session priority deadline 1/1
- Department of Homeland Security STEM Summer Programs application due 1/6
- The Naval Research Enterprise Internship Program (NREIP) due 1/6
- CalTech MURF Summer Program due 1/8
- Department of Energy SULI Summer Internship due 1/10
- Mickey Leland Energy Fellowship due 1/14
- The Harvard–MIT Summer School in Biophysics due 1/9
- The Summer Institute for Researchers in the Mathematical Sciences due 1/14
- Unequal Opportunities in Research and Education (UNO) due 1/15
- Center for Biofilm Engineering Summer Research Program (CBE) due 1/20
- University of Florida Program in Science and Technology (IPST) due 1/20

http://ugr.ucsc.edu/application_info
STEM Summer Research

- What are my options for summer research?
- Why should I do a Summer Research Program (SRP)?
- When should I do an SRP?
- What is a typical timeline to apply?
- How do I find a SRP?
- What are the eligibility requirements?
- What is included in an application?
- How many reference letters will I need?
- How do I get a strong reference letter if I don't have any research experience?
- What if the start date for the program is while I am still in classes?
- I am already well established in a research group. Should I leave for the summer for a SRP?
- What is a REU?
Summer Programs for International Students

Private Foundations (STEM); non-US citizens may be eligible

- American Physiological Society Summer Research Fellowships – including programs for underrepresented minorities
- American Society for Microbiology (ASM) Undergraduate Research Fellowship
- Biogen Idec
- Cold Spring Harbor Laboratory
- Genentech
- Howard Hughes Medical Institute (HHMI)
- ISIS Pharmaceuticals is a drug development and discovery company focusing exclusively on the therapeutic target RNA. ISIS has several summer research positions working in a number of areas. Summer research positions
- Jackson Laboratory
- Merck Research Laboratories, Interns
- Roswell Park Cancer Institute Summer Research Participation Program in Science
- Vertex

http://ugr.ue.ucsc.edu/Summer_research/other#additional
The Independent Project Option

Many students are interested in pursuing independent research projects and need to find a faculty sponsor. Listed below are some tips to help you succeed with an independent study project.

Steps to a Successful Independent Project

1. Check your Department's webpage to see if there is information posted about undergraduate research and/or independent study projects. Linguistics, for example, has a very useful site on undergraduate research and independent study.

2. Consider what quarter you should do your project. Independent projects take a significant amount of time. When you are planning your project, think about what other classes and personal commitments you will have that quarter.
Examples of Emails to Professors

Your email should:
- have an informative subject line
- be concise
- be formal: Dear Dr. Smith; Sincerely, Your Name
- not use Mrs.
- NOT have slang, abbreviations, or emoticons
- if applying for an opening:
  - address any qualifications the professor is looking for
  - demonstrate your experience
- if asking for a research opportunity:
  - state specifically your interest in that research group (you need to read the professor’s website)
  - explain why research is important for your goals

http://ugr.ue.ucsc.edu/email_examples
What Can I Do Now?

Frosh

- Get good grades!
- Use Academic Support Programs
  - Academic Excellence Program (ACE)
  - Learning Support Services Tutoring and MSI
  - Departmental tutoring
  - RAD and/or MEP
- Study in groups
- Use alternate media for additional explanations
Academic Support Programs

Check with your academic advisor for department specific programs.

**General Academic Support**

**Career Center**– The Career Center is dedicated to providing comprehensive, quality career development and employment/internship programs and resources that prepare a diverse student/alumni community to successfully meet today's and tomorrow's challenges.

**Disability Resource Center**– The DRC's goal is to assist the UCSC campus with equal educational access for students with disabilities.

**Educational Opportunity Program**– EOP provides a variety of academic and personal support programs designed to improve the retention and academic success of first-generation, low-income, or educationally disadvantaged college students. EOP serves to enhance undergraduate experiences by helping students acquire the skills to prepare for graduate programs, professional school, and future leadership roles. The **Pre-Graduate Program** hosts workshops every quarter.

**Learning Support Services**– Peer guided group sessions called Modified Supplemental Instruction (MSI) are available for selected lower and upper division undergraduate courses. Content related tutoring is available for all classes that are not supported by MSI.

**Services for Transfer and Re-entry Students**– STARS provides the extra academic and personal support transfer, re-entry and readmitted students may need to benefit fully from their education at UCSC whether they are full- or part-time. STARS is here to assist students with their pre-admissions questions, transfer, graduation planning.

http://ugr.ue.ucsc.edu/node/93
What Can I Do Now? (cont.)

Frosh

• Build relationships with your professors by going to office hours weekly
  • Class material: help, applications, or implications
  • Professor’s career development and current research
  • Advice on UR
  • Advice on careers (graduate school, summer research)
• Start to look into summer programs for next year
What Can I Do Now? (cont.)

Frosh

• Join a student group
  • Community
  • Networking
  • List on your division’s webpage
• Use the Career Center
  • Advice for choosing a major
  • Videos on webpage
  • Career fairs
Thank you!