

EDAB's Guide
To Finding a Research Position

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Engineering Deans' Advisory Board

Introduction

Penn Engineering's superior faculty research provides interested undergraduates unique and outstanding opportunities for undergraduate research. But how do you know if undergraduate research is right for you? Honestly, the best way is to try it out for a semester.

Why Do Undergraduate Research?

- One on one personal mentoring relationship with a Penn faculty member
- Out of the classroom laboratory experience: gain first hand experience of the ups and downs of any research project
- Opportunity to become knowledgeable about a topic you cannot learn about in the classroom
- Opportunity to network with professors, post-doctoral students, and graduate students
- Expand your internship and job opportunities: research in a specific field gives you access to new industry contacts and opportunities
- Help you decided if you want to go into academia or if you want a job in industry

Benefits of Undergraduate Research?

- Teaches you what you are interested (or not interested in)
- Gain independence by designing and working on your own project
- Develop a new set of skills that will help you in your classroom studies as well as your future job
- Enhance your skill set: research skills, communication and presentation skills, critical thinking abilities
- Boost your resume or graduate school application with records of undergraduate research grants, awards and faculty recommendations

Personal Areas of Interest

Which fields of research sound exciting? What kind of research can you see yourself doing? Brainstorm broad research fields that sound interesting (for example, neuroengineering or tissue engineering if you are a BE student) as a starting point. The following resources are helpful pinpointing your areas of interest:

- **Penn Research Centers and Institutes**
 - (<http://www.upenn.edu/research/CandI.htm>)
 - This list allows you to browse the various research centers at Penn and find more information on specific centers. The research landscape at Penn is constantly changing, and there are a few dead links as a result. Even so, this site is an excellent starting point to learn about the wide variety of research pursued across the University.
- **Penn Engineering Faculty Expertise Directory**
 - (<http://www.seas.upenn.edu/directory/departments.php>)
 - This site lists the primary faculty at Penn Engineering, along with their research interests broken down by center and field. Usually, the page provides links that you can use to learn more about a specific lab or any professor's research.
- **Professors**
 - Your current and past professors provide another wealth of information on various research fields, especially if their research is in one of your broad areas of interest. It is appropriate and encouraged to discuss research interests after lecture, during scheduled office hours, or during a scheduled appointment outside of class.
- **Faculty Advisors**
 - Your faculty advisor has likely been involved in research his/herself, and will be happy to speak with you about the research that interests you. Although research expertise will vary across your department, all advisors are a valuable source of information.

Useful Contacts

Throughout your search (and perhaps even after you begin your research position), the following resources may be helpful in defining your goal and receiving additional support:

- **Center For Undergraduate Research (CURF)**
 - <http://www.upenn.edu/curf/research/>
 - <http://www.upenn.edu/curf/research/research-directory> (Undergraduate Research Directory)
 - CURF is a University-wide resource devoted to helping undergraduates find research mentors or funding for individual research projects. CURF resources can help explain what you should expect from your undergraduate research experience. The Center also has a database of research mentors looking for undergrads, examples of past undergraduate research projects (including a few from Penn Engineering), and advice on how to find a faculty advisor.
 - Valuable CURF Contacts:
 - Dr. Wallace Genser, Associate Director for Undergraduate Research (call 215-746-6488 to make an appointment with Dr. Genser.): Dr. Genser can help you with the following:
 - Narrowing of research interests
 - Identification of potential advisors
 - Preparation of resume and initial emails to potential advisors
 - Identification of funding for undergraduate research
 - Research Peer Advisors
 - the CURF website lists Engineering-specific advisors at <http://www.upenn.edu/curf/research/research-peer-advisors/current-research-peer-advisors>)
 - RPAs are upperclassmen with extensive research experience, and you can email them to set up a time to discuss their experiences. They offer the following:
 - First-hand advice from other engineering students who have already gone through the process of finding a faculty research mentor
 - Information about professors in SEAS you may not find elsewhere
 - A good place to start if you are unsure what your research interests are
- **Faculty Advisors**
 - Your faculty advisor has likely been involved in research his/herself, and will be happy to speak with you about the research that interests you. Although research expertise will vary across your department, all advisors are a valuable source of information.
 - Faculty advisors should be able to give you a list of professors to email they know are doing research in areas related to your interests. This is a great way to learn about secondary faculty whom you might otherwise not be able to find out about
 - Your advisor can also help you determine the best way to reach out to professors by email (i.e. best subject line, what to mention in your email, etc.)
 - Some advisors might have corresponding research interests and can offer you a spot in their lab
- **Class Professors/Guest Lecturers**
 - Your current and past professors provide another wealth of information on various research fields, especially if their research is in one of your broad areas of interest. It is appropriate and encouraged to discuss research interests after lecture, during scheduled office hours, or during a scheduled appointment outside of class.

- If you are interested in the research of one of your professors, go talk to them after class to see if they have any availability in their lab or know about if a colleague has space.
- Alternatively, if you are interested in the research of a guest lecturer, get their contact info after their lecture.

Finding Assignments and Types of Positions:

Although this guide focuses on directly emailing professors, undergraduates find research positions in a variety of ways. Of course, the search method depends upon which type of position is desired. As you begin your search, it is important for you to understand what these positions entail and decide which is best for you. Keep in mind that regardless of your position title, you will most likely work with a graduate student in the lab before you have the opportunity to carry out your own research project. All expect to devote significant time to your lab work before having the opportunity to work on more involved and engaging projects. Some common positions:

- **Volunteer:** This includes working in a lab without pay or credit. This is a great option for getting your foot in the door, especially if you do not have previous research experience.
- **Independent Study Student:** This is another way to get your foot in the door without much research experience. Also, expect that many professors will expect you to start with doing research for credit before they are willing to pay you. This is not a reflection on you or your abilities, but merely part of the process as funds are not always available to pay undergraduate students.
- **Undergraduate Research Assistant:** This is typically a paid position, but otherwise the same as a volunteer and an independent study student.
- **Summer Research Student:** Some faculty open space in their labs for summer students from Penn and other universities through government funded Research Experience for Undergraduates (REUs). Penn Specific REUs include *SUNFEST* and *LRSM*. Other Penn specific programs exist such as the *Penn Undergraduate Research Mentoring Program (PURM)*.

Some avenues by which you can find these positions:

- **'Cold-emailing'** (applies to all position types): Discussed in detail throughout this guide.
- **Penn Student Employment Office** (for work study positions – generally undergraduate research assistant positions): Paid positions are listed on the Student Employment Office webpage.
- **Research Experiences for Undergraduates (REUs) and other University Programs** (for summer and other full-time experiences): Program organizers work with Penn Career services to host information sessions throughout the school year. These sessions explain the programs offered as well as the application process, which generally requires essays and professor recommendations just like other summer University programs do. Scan Penn Engineering emails (such as SEAS Weekly) or stop by the Career Services Office to learn more about the programs and find out who is hosting information sessions on campus.

Emailing

The most common way to reach potential research mentors is by email. Your first email communication should, first and foremost, convey your interest in this mentor's research and any openings in his/her lab. This email should also:

- Introduce yourself (if necessary) and highlight your qualifications
- Explain why you are interested in this lab
- Provide opportunity for follow-up

In general:

DO:

- State your major(s) and year
- Include a straightforward subject line (ex. Summer 2011 Research Opportunity)
- Highlight previous experience and research skills, if applicable
- Attach a resume
- Demonstrate that you have read about this mentor's research
- Provide your contact information and state how you will follow-up
- Send a follow up email within a few weeks if you do not get a response

DO NOT:

- Exceed two paragraphs
- Be informal
- Send the same email to every professor in your department
- Send a follow up email within 2 weeks of your initial email

You should be creative and draft your own emails, but we have included the following example as a guide:

Dear Professor Smith,

My name is Katherine Jones; I am a sophomore in Chemical Engineering. I am especially interested in fluid mechanics, and I recently came across the article you just published in *Northeastern Fluids*. I found your research on fluid particle behavior extremely fascinating, and I am writing to ask whether you have any openings in your lab. My senior year of high school, I worked in Professor Martin Min's catalysis lab at University of Michigan (my resume is attached), and so I understand the skills required to work in a ChemE lab.

If you have time, I would love to meet with you or one of your graduate students to discuss any openings. I can be reached via email or at (215) – 898 – 1234; please let me know what time is most convenient for you. Thank you very much for the consideration.

Sincerely,
Katie Jones

Department Websites

Finally, in the space below, we have included the links through which you can find information regarding research within each Penn Engineering Department:

- [BE Undergraduate Research](#)
- [CBE Undergraduate Research](#)
- [CIS Undergraduate Research](#)
- [ESE Undergraduate Research](#)
- [MSE Undergraduate Research](#)
- [MEAM Undergraduate Research](#)

Alternatives to Doing Engineering Research

Even after emailing professors, some students do not find a research position within the engineering school. Remember to keep an open mind. Research does not necessarily occur in the laboratory. When this happens, students often meet their research needs by:

- Doing research in another one of Penn's schools
 - Penn has four health schools (the School of Medicine, the Dental School, the Nursing school, and the School of Veterinary Medicine) and a law school which often look for engineers to work on laboratory research and other projects. Many students who cannot find a research position within the engineering school find one by emailing professors from these schools.
- Doing research outside of Penn
 - Many students do research at other universities, often ones located in their hometowns. While the process of procuring a research position varies by school, it is usually similar to the process at Penn: emailing professors who are doing research that interests you. In addition, many universities have special programs designed for students from other universities to do research over the summer.
- Working on Energy and Sustainability Projects
 - Penn places a large emphasis on the environment and sustainability. As such, there are many projects underway looking for undergraduates to help further green initiatives on campus especially through the new Energy and Sustainability minor. Projects range from retrofitting an old academic building with an effective energy plan to determining the feasibility of wind turbines on campus. For more info talk to the head of the Energy and Sustainability minor, Dr. John Vos.