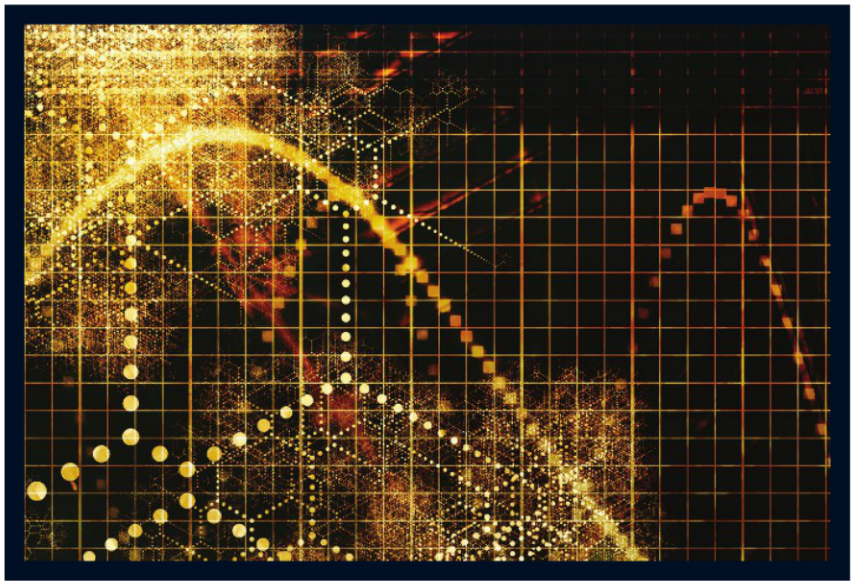

Optimize Your Summer Research Experience

If you want to go to graduate school, don't even think about a summer job in retail or at a restaurant. Students who are interested in graduate school need to be selective, targeting positions and internships that are research-oriented. Completing research as an undergraduate is key to preparing a competitive application.

Those who haven't already done so should apply immediately for a summer research experience. Set your sights on working at a company, national laboratory or college/university where you can research engineering problems and enhance your academic perspective. Whether you land a formal internship or volunteer with a professor on your campus, you need a position that will allow you to participate in research.

By considering these 10 points, at the end of the summer you will find yourself in a stronger position to apply for graduate school than when you arrived.

1. Establish a schedule. After your initial orientation, make time for lab work and reading papers related to the research. Take advantage of your summer university's offerings, such as free seminars.

2. Understand the lab culture. Learn about your research mentor (the lab's lead professor) and labmates. If they arrive at 8 a.m., you should arrive by 7:45 or earlier.

3. Be a good team player. Follow your program director's instructions. Don't yield to negative, competitive behavior that may cause animosity or discomfort.

4. Give your best effort. Read all assigned material – plus materials that you find to supplement assignments – and contribute to group discussions. Be respectful of others' time, efforts, food, experiments and deadlines. Talk to others, including postdocs, to learn about what they do. Ask about their journey and why they are so interested in their area of research. Meet often over lunch or coffee to talk.

5. Read, read, read. From journal papers written by your mentor and lab members to papers and posters on the walls of your department, read as much as possible. Reading FAQs, manuals and websites for all of the equipment in the lab will also help you learn how to trouble-shoot.

6. Solidify a new skill. Assess your knowledge when you arrive. What do you know well? Where are some of the gaps? How can you cement a new skill? Can you learn how to use the laser, increase your knowledge of partial differential equations or improve your programming skills?

7. Become a science enthusiast. Look up current events that are related to your work. Think, write, blog and tweet about the real-world applications. Let others know who you are. Don't be afraid to ask questions.

8. Absorb knowledge like a sponge. Go to the symposia in your department and consider the possible connections between your work and other departments. If the content is advanced for your current level, soak it up anyway. Write down terms and concepts that you don't understand. Then talk to people about what you understood and what you didn't understand. You're in a great position to say, "I'm a student so I'm still learning, but I'd like to learn something more about this." Professors enjoy talking about their work, and they appreciate interested students.

9. Try a new experiment, derivation or algorithm. You may discover something new! Get permission from your professor before tinkering with expensive equipment or chemicals.

10. Debrief your faculty mentor. At the end of the summer, request a meeting to summarize what you learned, express your appreciation and discuss future plans for graduate education. Add the experience to your CV or résumé, and stay in touch with your research mentor and program directors throughout the year. ■

Editor's Note: *Renetta G. Tull is Associate Vice Provost for Graduate Student Development & Postdoctoral Affairs at the University of Maryland, Baltimore County (UMBC). She annually presents on issues of graduate school admissions and preparation as part of the GEM GRAD Lab and Graduate Institute at the SHPE Conference.*