An Interdisciplinary Practicum Approach to Nanotechnology Curricula Integration
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Overview

Challenges:

- Nanotechnology topics are rarely taught to undergraduates.
- Practical, hands-on experiences require extensive training on complex, expensive equipment.
- Packed curricula leave little room to incorporate new classes and requirements.

Solution – Nanotechnology Fellows Program:

- Foster student awareness, interest, and knowledge of nanotechnology topics.
- Equip undergraduates with skills and experiences necessary to pursue careers in emerging technologies.
- Nurture excitement about science and engineering using tools and advancements in nanotechnology research.

The Fellows

The program is **interdisciplinary** with students and instructors from mechanical & aerospace, electrical & computer, biomedical, civil & environmental, and systems & management engineering as well as computer science.

Program Structure

- 8 week summer program
- Lessons on materials, devices, fabrication, and characterization.
- Training on soft lithography, electron beam lithography, deposition, etching, scanning electron microscopy, atomic force microscopy, and electrical probing.
- Labs and mini-projects for each technique.
- Interdisciplinary research projects.
- Professional development workshops.

Courses & Facilities

Nanotechnology Devices & Systems:
How they are made, measured, and monetized

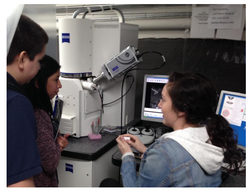
- 1 credit seminar
- Open to any major
- Team-taught
- Topics include fabrication, characterization, and commercialization.

Connecting Nanotechnology to Your World

- Online course
- Project creates nanotechnology teaching resource for core science/engineering courses

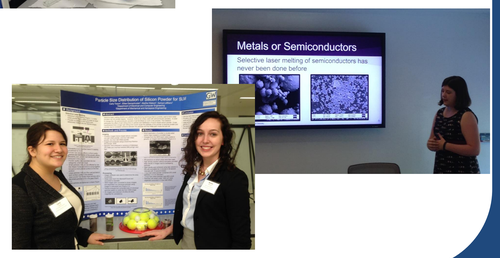
The program uses GWU's **Nanofabrication& Imaging Center** and the unique **Nanotechnology Teaching Laboratory** located in the heart of Washington, D.C.

Outreach Activities



Fellows do demonstrations and hands-on activities with local high school students and teachers.

Fellows present their research to peers, alumni, and community members at events like the school-wide R&D Showcase.



For more information

Visit us at **blogs.gwu.edu/nanotechfellows**
or **www.leblanclab.com/nanotechnology-fellows**

Testimonials

"This program has escalated my understanding of **what it takes to be an engineer**… I went from reading textbooks and sitting in large lectures to working in a lab and learning the basics of upper-level courses… I'm analyzing recent research articles and then instantly applying that knowledge… this program provides a **hands-on and personal experience** unlike a lot of other opportunities."

"I feel like I have learned a lot each day about things that I otherwise would have never been exposed to. The best part of the program, I think, is the amount of **hands-on training** that we have received. Having this type of experience so **early in our college careers** creates a safe environment for us to figure out which types of research we are most interested in-- or if we are interested in research at all."

"The focus is on Nanotechnology but the program doesn't just throw you into the middle of that vast subject -it introduces you to all the subjects necessary to build a foundational knowledge and then enhances all of these with hands on experiences. We have learned about **materials, physics, chemistry, monetization, and the professional skills** necessary to share the things we have learned with others. Out of all the aspects of the program, I'd have to say that the structure is my favorite. In the mornings we learn in more of a lecture style while the afternoon concretes the ideas with hands on experiences. "