

UC San Diego Establishes Department of NanoEngineering

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Seeking to capitalize on the potential of a new generation of multi-functional nanoscale devices and special materials built on the scale of individual molecules, UC San Diego has established a new Department of NanoEngineering within its Jacobs School of Engineering effective July 1. Undergraduate and graduate students will learn from an interdisciplinary team of professors who are leaders in various fields of engineering, physics and chemistry and a variety of new sub-disciplines where those fields overlap.

"Many of the most exciting, cutting-edge discoveries are being made at the interfaces of scientific and engineering disciplines," said UCSD Chancellor Marye Anne Fox. "This new Department of NanoEngineering, one of the first such departments in the nation, continues UC San Diego's leadership role in the paradigm shift to interdisciplinary research and education in revolutionary new fields that will benefit both society and the planet."

The new department will cover a broad range of topics, but focus particularly on biomedical nanotechnology, nanotechnologies for energy conversion, computational nanotechnology, and molecular and nanomaterials.

"Nanotechnology promises to produce revolutionary advances in medical diagnostics and treatments, energy systems, electronics and materials," said Frieder Seible, dean of the Jacobs School. "Yet we are only just beginning to understand how to assemble and fabricate nanocomponents into higher order materials. Our industry partners tell us they need a new breed of engineers trained in this field to help them fulfill their future workforce needs, not just on the biotechnology side, but in many other areas."

The Department of NanoEngineering's educational program will develop in phases, with plans to reach a steady state of approximately 20 faculty members and an enrollment of 400 undergraduate students and 120 graduate students. The department will also serve as the administrative home of the existing undergraduate and graduate programs in chemical engineering.

The Department of NanoEngineering is supported by faculty in the five other departments at the Jacobs School, and the new department is seeking collaborations with faculty throughout UCSD. The leadership team that was the driving force for creating the new department is made up of engineering professors Sadik Esener (Department of Electrical and Computer Engineering), Michael Heller (Department of Bioengineering), Sungho Jin (Department of Mechanical and Aerospace Engineering), Jan Talbot (Chemical Engineering program within the Department of Mechanical and Aerospace Engineering), and Kenneth Vecchio (Department of Mechanical and Aerospace Engineering).

In the past five years alone, the five members of the leadership team filed 51 patent applications and licensed 6 inventions to private companies. Those professors and their fellow faculty members will continue to work closely with the Jacob School's William J. von Liebig Center for Entrepreneurism and Technology Advancement and UCSD's Technology Transfer and Intellectual Property Services office to accelerate the commercialization of discoveries and prepare engineering students to contribute to the local, national, and global entrepreneurial workplace.

The new department will capitalize on a growing trend throughout public and private research-funding organizations to focus on nanoscience and nanotechnology approaches that have the potential to make valuable contributions to biology and medicine. For example, in recent solicitations for research proposals, the National Institutes of Health said, "A revolution has begun in science, engineering, and technology based on the ability to work on a nanoscale."

In a manifestation of that revolution, in September 2005 the National Cancer Institute implemented a \$144 million initiative by forming eight Centers for Cancer Nanotechnology Excellence (CCNE) in the U.S., including one at UCSD and its Moores Cancer Center. Esener, a professor of electrical and computer engineering and the founder of several startup companies, is the principal investigator of the CCNE based at UCSD. That center, which includes scientists at the Burnham Institute for Medical Research and University of California campuses at Irvine, Riverside, and Santa Barbara, brings together the best and brightest from engineering, chemistry, physics, mathematics, biology and health sciences to use nanotechnology to help fight cancer. Esener's CCNE will work closely with the new Department of NanoEngineering.

The new department will occupy nearly half of a new 110,000-square-foot building, currently in the final stages of design that will be built by 2010. The building will house core instructional and laboratory area and complement the existing Nano3 facility at the UCSD division of the California Institute of Telecommunications and Information Technology (Calit2). The Nano3 facility provides an advanced cleanroom environment to UCSD researchers investigating nanoengineering, nanomedicine, and nanoscience.

The grassroots creation of the Department of NanoEngineering is an outgrowth of the strong tradition of "shared governance" of three branches: the Board of Regents, the administration, and the Academic Senate. This governance style of mutual helpfulness and collaboration in effect on all 10 UC campuses was invented by the University of California in the 1920s and has been credited with enabling the UC system to continually renew itself and do great things.

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