

**Symposium on Undergraduate Nano-Education:  
"Addressing the Challenges of Nanoscale Science & Engineering Education"**

**Presentation:**

Research Integrated Education in Bio-Nanotechnology  
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**Presenter Biography:**

Samir Iqbal is an Assistant Professor at the University of Texas at Arlington (UT-Arlington) in the Department of Electrical Engineering. He is also affiliated with the Nanotechnology Research and Teaching Facility (NanoFab) and is a member of Joint Graduate Studies committee of Bioengineering Program of UT Department of UT-Arlington and UT Southwestern Medical Center at Dallas. Recipient of NSF CAREER award in 2009, he directs Nano-Bio Lab with focus on chip based early disease diagnostics, bio-inspired rapid nano-fabrication and use of aptamers for cancer nanotechnology. As a graduate student, he was awarded Magoon Award for Excellence in Teaching by the College of Engineering at the Purdue University. At UT-Arlington, he has introduced a cross-disciplinary course "Fundamentals of Bio-Nanotechnology" and is actively engaged in bio-nano outreach to K-12 students in Arlington, TX area. He is a senior member of IEEE and professional member of American Physical Society, American Association for the Advancement of Science, Biomedical Engineering Society, Biophysical Society, and Electrochemical Society.

**Abstract:**

The field of nanotechnology has seen unprecedented growth and development in last few years. It has been even termed as a "disruptive technology", a technology that can sustainably overturn the existing dominant technological paradigms in the act of its evolution. Although there is a consensus that such technologies are revolutionizing the characterization and prediction of the pathologic behavior of diseased cells, there is no academic program integrating the vital aspects of training and nurturing scientists that can systemically understand and innovate at the interface of nanotechnology and biology. This presentation focuses on an engineering coursework approach to institute and instigate an academic curiosity in Bio-Nanotechnology – an area abound with the confluence of cross-cutting research in biology and engineering. We present our approach to develop a course "Fundamentals of Bio-nanotechnology," designed to (1) Cater for broad accessibility (for students from engineering and natural sciences); (2) Build design problems of interest that cross the traditional boundaries; (3) Accelerate assimilation of new knowledge spanning multiple domains; (4) Effectively exchange knowledge about the state-of-the-art developments and capabilities; and (5) Create innovative research solutions to the contemporary problems. The course is thus integrating fundamentally transformative approach to train and retain students for research at the interface of life sciences and nanomaterials.