



Course Series
January 23-25, 2019



Nanomaterials and Microtechnologies:

Fundamentals and Applications to Environment and Healthcare

Instructor: Professor Tianhong Cui, University of Minnesota,
Chaire Blaise Pascal, Fondation ENS, on leave at ESIEE Paris, ESYCOM Lab., Université Paris-Est

January 23 (Wednesday) 9h00-12h30; January 24 (Thursday) 9h00-12h30, January 25 (Friday) 9h00-13h00

Location: Amphithéâtre Marcel DASSAULT, ESIEE Paris. Access map: <https://www.esiee.fr/fr/acces>

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Scope: This class is designed for graduate students (Master, PhD) as well as young researchers with different backgrounds. It is an introductory course, which will cover various aspects of nanomaterials and microtechnologies and their applications to environment and healthcare. After this course, the students are expected to meet the following objectives: to know the major classes and applications of nanomaterials and microtechnologies, to demonstrate an understanding of the fundamental principles behind the operation of micro devices/systems, to gain an understanding of standard micro- and nano-fabrication techniques, and to make the study of MEMS enjoyable. For detailed information, please refer to the following introductory information on the course topics:

- (1) Introduction to Nanomaterials and Microtechnologies
- (2) Introduction to Microelectromechanical Systems (MEMS)
- (3) MEMS Principles
- (4) Lithography Technologies
- (5) Thin Film Deposition
- (6) Bulk Micromachining
- (7) Surface Micromachining
- (8) Layer-by-Layer Nano Self Assembly
- (9) Micro- and Nano-Sensors for Environment and Healthcare
- (10) Lab-on-a-Chip for Environment and Healthcare



Tianhong Cui is currently the Distinguished McKnight University Professor at the University of Minnesota. He is a professor in Mechanical Engineering and an Affiliate Senior Member of the graduate faculty in Department of Biomedical Engineering and Department of Electrical Engineering. He joined the faculty of the University of Minnesota in 2003. From 1995 to 2003, he held research or faculty positions at Tsinghua University, University of Minnesota, National Laboratory of Metrology in Japan, and Louisiana Tech University, respectively. He was a visiting professor at

University of Freiburg in Germany in 2006, and he holds a visiting professorship at Tsinghua University and University of Paris East. Recently he was awarded the Blaise Pascal Chair for Excellence from ENS Foundation in France. His current research interests include MEMS/ NEMS and nanotechnology for medical applications. He received research awards including the STA & NEDO Fellowships in Japan, the Alexander von Humboldt Fellowship in Germany, the Outstanding Editor Award from Nature Publishing Group, and numerous best paper awards. He is a fellow of American Society of Mechanical Engineering (ASME). He is the founding Executive Editor-in-Chief for two Nature journals, *Light: Science & Applications* and *Microsystems & Nanoengineering*.