

Montgomery County Community College  
ESC 215  
Nanotechnology Applications  
3-2-2

#### COURSE DESCRIPTION

This course covers the applications of nano-scale devices and systems and the material chemical, physical, biological, or multiple-property requirements necessitated in these applications. Material modifications to meet these requirements will be addressed including structure control, composition control, surface property control, strain control, functionalization, and doping.

This course is designed to be one of six capstone courses (Esc 211, 212, 213, 214, 215, 216) for the Penn State Semiconductor Manufacturing Technology (SMT) program. The course is lab intensive, leveraging the Nanofabrication Facility on the University Park campus. All lectures will be given in a technology classroom, Suite 114 Lubert Bldg., Research Park. This classroom is dedicated to the Center for Semiconductor Manufacturing Technology and thus has a wide variety of very specialized, "hands-on" materials and facilities continually available to students. The course grade evaluation will use a mixture of tests, presentations, reports, and project assignments. Teaming and team problem solving will be stressed.

#### REQUISITES

*Previous Course Requirements*

ESC 214 Patterning for Nanotechnology

*Concurrent Course Requirements*

None



Topic 5	Lecture Discussion Labs	Ion implantation Lab 4 results (cross-wafer uniformity) Boron implant into n-type substrate
Topic 6	Lecture Discussion Labs	Rapid thermal annealing Activation of boron implant
Topic 7	Lecture Discussion Labs	Diffusion