

Central Arizona College

8470 N. Overfield Road
Coolidge, AZ 85128
Phone: (520) 494-5444

Nanofabrication Technology A.A.S. Degree

Program Description for the Catalog: The Nanofabrication Technology degree program offers students the opportunity to enter the exciting world of Nanotechnology. The prefix Nano comes from the word nanometer(nm) which is one billionth of a meter. Nanofabrication and nanotechnology is engineering at the atomic length scale, a size range which until recently was only available to nature. Being able to engineer such small structures opens the door to a multitude of new opportunities in the fields of chemical technology, bio-technology, biopharmaceutical labs, micro-technology labs, material science labs, and electronic technology. Recommended: Strong math and science background. Prerequisites: RDG094, MAT092, and CHM130.

Effective Term: Fall

Effective Year: 2012

Semester Hours: 66

Prerequisites: RDG094 College Reading
MAT092 Introductory Algebra
CHM130 Fundamental Chemistry

Corequisites: None

Recommended Proficiencies: Strong math and science background.

List of Course Requirements for the Catalog: Nanofabrication Technology A.A.S. Degree (70 Credits)
General Education Requirements (36)

For the following four categories, select AGEC courses:
Written Communications (3)
ENG100 English Composition III (3) or higher ENG course

Oral Communications (3)
COM100 Fundamentals of Human Communication (3) or
higher COM course
Arts and Humanities (3)

Social and Behavioral Sciences (3)

Physical and Biological Sciences (16)

PHY111 College Physics I (4)

PHY112 College Physics II (4)

CHM151 General Chemistry I (4)

CHM152 General Chemistry II (4)

Mathematics (8)

MAT151 College Algebra (4)

MAT182 Trigonometry with Algebra Review (4)

Core Requirements(30)

ELC122 Direct Current and Alternating Current Circuit Analysis (3)

ELC200 Radio Frequency RF/High Vacuum HV (3)

ELC220 Active Circuits(3)

MET230 Semiconductor I-Seminar(3)

MET290 Material, Safety and Equipment Overview for Nanotechnology(3)

MET291 Basic Nanotechnology Processes(3)

MET292 Materials in Nanotechnology(3)

MET293 Patterning for Nanotechnology(3)

MET294 Materials Modification in Nanotechnology(3)

MET295 Characterization, Testing of Nanotechnology Structures and Materials(3)

Other Requirements (4)

Reading Competency: RDG094 College Reading

Physical Education Activity, PAC or DAN (1), excluding varsity sports

Computer Competency (3)

Select from the following:

AGB124 Microcomputers in Agriculture

CIS110 or higher CIS course

Computer Competency course

Cumulative grade point average of at least a 2.0 on a 4.0 scale

Grade of "C" or better required in each course.

Minimum of 20 credits completed from CAC

Measureable Student Learning Outcome Statements for 1. (Application Level) Demonstrate the proper use of test equipment including oscilloscope, signal generators and multi-meters.

Program: 2. (Knowledge Level) Describe the basic material types used

in nanofabrication.

3. (Comprehension Level) Define and explain the interdisciplinary nature of the nanoscience field.
4. (Application Level) Properly operate equipment used in the basic nanofabrication process.
5. (Comprehension Level) Explain the safety and health issues involved with the nanofabrication process.
6. (Evaluation Level) Describe and evaluate various vacuum pump systems and verify when a system is functioning properly.
7. (Knowledge Level) Describe thin film deposition and etching practices.
8. (Comprehension Level) Explain the aspects of photolithography from the design to mask fabrication to pattern transfer and inspection.
9. (Application Level) Demonstrate effective communication skills by writing technical reports based on laboratory experiments.
10. (Evaluation Level) Demonstrate critical thinking/problem solving abilities by analyzing a non-functioning electrical circuit, determining the problem and restoring circuit operation.

**Internal/External
Standards/Accreditation
for Program:** Nanotechnology Standards: URL

**General Education
Outcomes:** Communication Critical Thinking and Analytical Reasoning
Individual and Social Responsibility
Informational/Technological Literacy

Revised: February 16, 2012