

Nanotechnology, AAS

School of Math, Science and Engineering

Program Description

The Nanotechnology AAS prepares students for work in diverse fields such as biotechnology, pharmaceutical research, nanomanufacturing, semiconductor manufacturing, and more. Students learn to work with materials at nanoscale in analysis, production, and data collection. Graduates' skills include product flow, quality control, and problem solving. Students complete the first three semesters at Westmoreland then complete nanotechnology courses at the Nanofabrication Facility at Penn State University (PSU) in University Park, PA. Students need to apply for admission for the nanotechnology program at PSU at least one semester prior to the semester at PSU. Tuition for MPT courses completed at Penn State will be equal to Westmoreland tuition.

Career Opportunities

Occupations for graduates of this program include laboratory, quality control, and manufacturing technicians in fields such as bionanotechnology, medicine, pharmaceutical and semiconductor manufacturing, optoelectronics, biomedical applications, and microelectromechanical devices.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Demonstrate an understanding of nanotechnology principles and concepts.
- Apply concepts from chemistry, engineering, electronics, and mathematics to nanotechnology experiments and nanomanufacturing.
- Apply understanding of nanofabrication manufacturing systems to practical situations and laboratory results to experimental applications.
- Operate and maintain nanotechnology electromechanical equipment used in nanotechnology laboratories and basic nanofabrication manufacturing.
- Identify, analyze, and troubleshoot problems using systems approach.
- Schedule production, test materials, integrate systems.
- Communicate effectively and appropriately; record and report information significant to the job.

Sugg. Term	Seq #	Course ID	Course Title	Cr.	Prereq/Coreq(Co)	Options Available
1st Fall	1	PDV 171	Career Pathway Exploration	3		
	2	MPT 101	Introduction to Nanotechnology	1		
	3	MTH 157	College Algebra	3-4	MTH 100 or Placement	MTH 167, MTH 172, MTH 173, MTH 271, MTH 272, MTH 275, MTH 277, MTH 108, or MTH 109
	4	ENG 161	College Writing	3	ENG 085 with Permission of Instructor, ENG 095 or Placement	
	5	CHM 107	Intro. Concepts in Chemistry I	4	MTH 052 or Placement	CHM 108, CHM 150/151, CHM 160/161, or CHM 225
1st Spring	6	ENG 162	Technical Communication	3	ENG 161	ENG 164
	7	CPT 145	Introduction to Computer Technology	3	Varies	CPT 150, CPT 160, DFT 258, or DFT 266
	8	PHY 107	Applied Physics	4	MTH 100, MTH 108, or Placement	PHY 155, PHY 156, PHY 255, or PHY 256
	9	Elective	Restricted Program Elective	3-4		
	10	Elective	Restricted Program Elective	3-4		
2nd Fall	11	SOC 155	Principles of Sociology	3	Varies	PSY 160, ECN 255, ECN 256, or GEO 155
	12	PHL 202	Logic	3	ENG 161	PHL 103, SPC 155, or SPC 156
	13	Elective	Restricted Program Elective	3-4		
	14	Elective	Restricted Program Elective	3-4		
2nd Spring	15	MPT 211	Material Safety & Equipment Overview	3	MTH 157 & ENG 161	
	16	MPT 212	Basic Nanotechnology Processes	3	MTH 157 & ENG 161	
	17	MPT 213	Materials in Nanotechnology	3	MTH 157 & ENG 161	
	18	MPT 214	Patterning For Nanotechnology	3	MTH 157 & ENG 161	
	19	MPT 215	Materials Modification for Nano Applications	3	MTH 157 & ENG 161	
	20	MPT 216	Testing of Nano Structures and Materials	3	MTH 157 & ENG 161	

Minimum Program Credits

60-65*

NNT

*This program requires at least 60 credits. Courses taken to fulfill Restricted Program Electives may not also be used to fulfill other course requirements within the program. Restricted Program Electives: ALH 122; BIO 107; BIO 145; BIO 155; BIO 156; BIO 171; BIO 172; BIO 210; BIO 255; BIO 265; BIO 285; BUS 158; BUS 262; CHM 107; CHM 108; CHM 150/151; CHM 160/161; CHM 260/261; CHM 270/271; CHM 225; CHM 275; CPT 145; CPT 150; CPT 160; CPT 163; CPT 180; CPT 182; CPT 213; DFT 112; EGR 104; EGR 210; EGR 221; EGR 227; ELC 102; ELC 106; ELC 107; ELC 114; ELC 202; ELC 206; ELC 213; MTH 160; PHY 107; PHY 155; PHY 156; PHY 255; PHY 256; PHY 258; PHY 259;