

## Applied Science and Engineering Technology Program

The Applied Science and Engineering Technology program prepares students for employment in a range of scientific technology occupations and also provides a foundation for transfer to four-year technology programs. The flexible design of the program allows students to choose from a range of scientific technology fields, including biotechnology, nanotechnology and process technology, among others.

The program includes a set of courses required of all students and gives students the opportunity to select specialized courses in a particular field of interest, leading to a certificate of completion in a specialized field. Some students may initially opt to finish a certificate without completing the degree in order to directly enter the workforce. Students who do so and who later decide to pursue the associate's degree will have a seamless transition to the degree program, since all credits earned through the certificate of completion will also count toward the degree itself.

### STUDENT LEARNING OUTCOMES:

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

- Demonstrate foundation knowledge in at least one technology field.
- Demonstrate laboratory skills in basic sciences.
- Demonstrate the ability to approach current societal issues from a scientific perspective.
- Present technical information in oral, written or graphic format.
- Work effectively as part of a team.
- Articulate and practice professional skills as applied to a technical area of expertise.

In addition, students will be prepared to work in a range of industries at the technician level. Below is a list of some of the positions a graduate of the program could fill (depending on which certificate or certificates are completed).

- Process technician or operator in industries such as oil refining, food processing and water purification.
- Biotechnology technician in the biopharmaceutical industry.
- Biomedical research technician.
- Process analyst in a wide range of industries utilizing nanotechnology.

### PROGRAM ENTRY REQUIREMENT:

This program is open to all interested students. However, some certificates offered as part of the degree are select, and students interested in particular certificate programs should consult with the department head.

All new students are normally required to take the College's placement test at their time of entry. Students who are identified as needing developmental course work must satisfactorily complete the appropriate English and mathematics courses as a part of their degree program.

Admission to the Biomedical Technician Training program (BTTP) is selective. BTTP is a partnership between Community College of Philadelphia and Wistar Institute. To apply, students must have completed a minimum of 12 credits at an accredited college or university with a GPA of 2.5 or better and also completed the following courses with a grade of "C" or better: Math 118, English 101, Chemistry 110 or 121 and Biology 123. Students must successfully complete an in-person interview with the BTTP Academic coordinator and BTTP program director from Wistar Institute.

Admission to the Nanofabrication Manufacturing Technology (NMT) program is selective. NMT is a partnership between Community College of Philadelphia and the Center for Nanotechnology Education and Utilization at Penn State University. Students must have completed a minimum of 12 credits at an accredited college or university with a GPA of 2.5 or better, and also completed the following courses with a grade of "C" or better: Physics 105 (or higher) and Chemistry 110 (or higher). In addition, students must successfully complete an in-person interview with the department head and provide a letter of reference from an instructor of a science course taken by the student.

Students interested in one of these select programs should contact the Division of Math, Science and Health Careers in Room W2-7 or by telephone at 215-751-8430 in order to learn more about the application process.

### PROGRAM OF STUDY AND GRADUATION REQUIREMENTS:

A minimum of 60 credits as prescribed must be completed with a minimum grade point average of 2.0. A minimum grade of "C" must be achieved in all certificate and required program courses. Specific certificates taken in conjunction with the degree may require more than 60 credits.

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**APPLIED SCIENCE AND ENGINEERING TECHNOLOGY**

<b>Course Number and Name</b>	<b>Prerequisites and Corequisites</b>	<b>Credits</b>	<b>Gen Ed Req.</b>
<b>FIRST SEMESTER</b>			
ASET 101 – Science, Technology and Public Policy		3	
Math 118 – Intermediate Algebra		3	Mathematics
ENGL 101 – English Composition I		3	ENGL 101
CIS 103 – PC Applications		3	Tech Comp
Lab Science or Applied Science Course*		3-4	
<b>SECOND SEMESTER</b>			
ASET 110 – Safety, Health and the Environment or ENGR 211 – Material, Safety & Equipment Overview for Nanofabrication		3	
Choose two*: PHYS 105 – Survey of Physics (or higher) or Chem 110 – Introductory Chemistry (or higher) or BIOL 106 – General Biology I or higher		8	Natural Science
Math Elective or ASET 119		3	
ENGL102 – English Composition II	ENGL 101	3	ENGL 102, Info Lit
<b>THIRD SEMESTER</b>			
ASET 120 – Quality Control/Quality Assurance		3	
Choose one*: PHYS 105 – Survey of Physics (or higher) or CHEM 110 – Introductory Chemistry (or higher) or BIOL 106 – General Biology I or higher		4	
Lab Science or Applied Science Course**		3-4	
Lab Science or Applied Science Course**		3-4	
Social Science Elective		3	Social Sciences
<b>FOURTH SEMESTER</b>			
Internship or Directed Elective**		3	
ASET 185 – Ethics and Culture of the Applied Sciences Workplace		3	
Internship or Directed Elective**		3	
Humanities Elective		3	Humanities
<b>MINIMUM CREDITS NEEDED TO GRADUATE</b>		<b>60</b>	

**General Education Requirements**

Students in this program are required to complete at least one course that is designated Writing Intensive, at least one course that is designated Interpretive Studies and at least one course that is designated American/Global Diversity. Students must choose electives that fulfill these requirements. Students may use the same course to fulfill more than one of these requirements. A list of courses which fulfill these requirements is available in this Catalog or at [www.ccp.edu](http://www.ccp.edu).

\* Students must take at least one Physics course, at least one Biology course and at least one Chemistry course.

\*\* Lab Science or Applied Science courses are selected to meet specialized employment and/or transfer requirements and are selected with the approval of the department head.

**For More Information Contact:**

The Division of Math, Science and Health Careers, Room W2-7, 1700 Spring Garden Street, Philadelphia, PA 19130, Telephone (215) 751-8430; or the College Information Center (215) 751 8010.

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## APPLIED SCIENCE AND ENGINEERING TECHNOLOGY CERTIFICATES

The following certificates of completion are available.  
Courses from these certificates may be applied toward the associate's degree.

Course Number and Name	Credits
<b>Biomedical Technician Training Program Certificate of Completion</b>	
BTT 100 – Introduction to Biomedical Technology	1
BTT 101 – Biomedical Lab Internship I	3
BTT 201 – Biomedical Technology Internship II	3
<b>Biotechnology Certificate of Completion</b>	
CHEM 121 – College Chemistry I	4
CHEM 122 – College Chemistry II	4
BIOL 123 – Cellular and Molecular Biology	4
BIOL 211 – Genetics	4
BIOL 241 – Principles of Microbiology	4
BIOL 251 – Biotechnology I (new course)	4
BIOL 252 – Biotechnology II (new course)	4
<b>Process Technology Competency Certificate of Completion</b>	
CHEM 110 – Introduction to Chemistry	4
PTEC 101 – Introduction to Process Control	3
PTEC 102 – Plant Equipment	2
MATH 118 – Intermediate Algebra	3
ASET 110 – Safety, Health and the Environment	3
CIS 103 – PC Applications	3
<b>Process Technology Proficiency Certificate of Completion</b>	
PTEC 111 – Process Control I	3
PTEC 115 – Process Control II	3
PTEC 125 – Fluid Power and Controls	4
PTEC 120 – Unit Operations	3
ASET 120 – Quality Control / Quality Assurance	3
PHYS 105 – Survey of Physics	4
ENGL 101 – English Composition I	3
ASET 119 – Problem Solving for Technology	3
<b>Nanofabrication Manufacturing Technology Certificate of Completion</b>	
ENGR 210 – Nanofabrication Manufacturing Technology Seminar	2
ENGR 211 – Material, Safety & Equipment Overview for Nanofabrication	3
ENGR 212 – Basic Nanofabrication Processes	3
ENGR 213 – Thin Films in Nanofabrication	3
ENGR 214 – Lithography for Nanofabrication	3
ENGR 215 – Materials Modification in Nanofabrication	3
ENGR 216 – Characterization, Packaging and Testing of Nanofabrication Structures	3

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