

# Pharmaceutical and Laboratory Science

*School of Mathematics, Science, and Engineering*

Dean Kathy Tyner, M.S., Office 345, 619-482-6459

Faculty David R. Brown, Ph.D. • David Hecht, Ph.D. • Tinh-Alfredo V. Khuong, Ph. D. • Jacquelyn Thomas, M.S. • Kathy Tyner, M.S.

Department Chair Tinh-Alfredo V. Khuong, Ph.D.

## General Description

The chemical industry is diverse, vast, and touches nearly every aspect of our lives on a daily basis. Pharmaceutical and laboratory science is a discipline in which chemical principles are applied to solve problems or produce materials in a wide range of fields in the areas of high-technology, consumer products, and healthcare. An education in pharmaceutical and laboratory science provides the skills and knowledge essential to carry out the tasks necessary to push forward the progress of the multi-billion dollar chemical industry, including hands-on experience with state-of-the-art analytical instrumentation, small molecule synthesis, computational methods, and protein electrophoresis and purification.

## Career Options

The San Diego region is home to one of the highest concentrations of pharmaceutical, biotechnology, and other chemistry-based industries in the United States. An ever-increasing demand for skilled chemical technicians exists in the local job market. Graduates of the program will have gained the knowledge and skills necessary to perform many of the key laboratory tasks undertaken in a variety of industrial settings where research and development and/or manufacturing take place. Chemical technicians provide valuable support in companies involved in drug discovery, environmental and forensics analyses, development of new materials, petroleum refining, and the manufacturing of plastics, electronic materials, textiles, paints, foods and beverages, and cosmetics, among many others.

## Degree/Certificate Options

### Associate in Science Degree: Career Technical

	Major Code
Pharmaceutical and Laboratory Science	A1532

### Certificate of Achievement

Pharmaceutical and Laboratory Science	A1533
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*Consult with a counselor to develop a Student Education Plan (SEP), which lists the courses necessary to achieve your academic goal.*

Web site for Pharmaceutical and Laboratory Science major:  
<http://www.swccd.edu/~chemtech>

# Associate in Science Degree

## Pharmaceutical and Laboratory Science

Career/Technical (Major Code: A1532)

Composed of a comprehensive collection of instructional and laboratory experiences directed toward readying graduates for entry-level positions in a wide variety of chemistry-based industries such as pharmaceutical, biotechnology, paints and coatings, and electronic materials. The program curriculum is structured to equip students with many of the technical skills and competencies identified by the American Chemical Society as essential in the preparation of well-trained chemical technicians.

### Prerequisites

MATH 121 Applied Calculus I (3)		
<b>OR</b>	3-5	
MATH 250 Analytic Geometry and Calculus I (5)		
CHEM 200 General Chemistry I	5	
CHEM 210 General Chemistry II	5	
<b>Total units</b>	<b>13-15</b>	

### First Semester

CHEM 150 Introduction to Chemical Technology	2	
CHEM 180 Computational Methods in Chemistry	2	
MATH 122 Applied Calculus II (3)		
<b>OR</b>	3-4	
MATH 251 Analytic Geometry and Calculus II (4)		
PHYS 170 College Physics I		
<b>OR</b>	3	
PHYS 270 Principles of Physics I		
PHYS 171 College Physics Laboratory I		
<b>OR</b>	1	
PHYS 271 Principles of Physics Laboratory I		

### Second Semester

CHEM 190 Chemical Health and Safety	2	
PHYS 172 College Physics II (3)		
PHYS 173 College Physics Laboratory II (1)		
<b>OR</b>	4	
PHYS 272 Principles of Physics II (4)		

### Third Semester

CHEM 240 Organic Chemistry I	5	
CHEM 250 Analytical Chemistry	5	

### Fourth Semester

CHEM 160 Introductory Biochemistry	3	
CHEM 242 Organic Chemistry II	5	
CHEM 161 Biochemical Techniques		
<b>OR</b>	2	
CHEM 244 Organic Analysis and Spectroscopy		

**Total units 37-38**

To earn an associate degree, additional general education and graduation requirements must be completed.  
See page 40.

# Certificate

## Pharmaceutical and Laboratory Science

Certificate of Achievement

Career/Technical (Major Code: A1533)

### First Semester

CHEM 150 Introduction to Chemical Technology	2	
CHEM 180 Computational Methods in Chemistry	2	
MATH 122 Applied Calculus II (3)		
<b>OR</b>	3-4	
MATH 251 Analytic geometry and Calculus II (4)		
PHYS 170 College Physics I		
<b>OR</b>	3	
PHYS 270 Principles of Physics I		
PHYS 171 College Physics Laboratory I		
<b>OR</b>	1	
PHYS 271 Principles of Physics Laboratory I		

### Second Semester

CHEM 190 Chemical Health and Safety	2	
PHYS 172 College Physics II (3)		
PHYS 173 College Physics Laboratory II (1)		
<b>OR</b>	4	
PHYS 272 Principles of Physics II (4)		

### Third Semester

CHEM 240 Organic Chemistry I	5	
CHEM 250 Analytical Chemistry	5	

### Fourth Semester

CHEM 160 Introductory Biochemistry	3	
CHEM 242 Organic Chemistry II	5	
CHEM 161 Biochemical Techniques		
<b>OR</b>	2	
CHEM 244 Organic Analysis and Spectroscopy		

**Total units 37-38**