



# Chemistry

## *Purposes*

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- To prepare students for entrance into graduate school and eventually for professional work in chemistry or related fields;
- To prepare students, who don't wish to attend graduate school, to enter the field of industrial chemistry immediately after graduation;
- To prepare students to teach chemistry or physical science at the secondary education level;
- To provide students with the opportunity to participate as partners with their professors in nationally reported research projects;
- To provide students with a general knowledge of chemistry and its relation to society.

## *Tradition of Excellence*

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The strength and reputation of the Chemistry program has been well established over the past 40 years. Quality classroom instruction coupled with personal contact with caring faculty lays the foundation for our students' success. Small classes and deliberate faculty mentoring provides students the knowledge and confidence to pursue their career goals. At PLNU we understand that chemistry is a laboratory science. Almost all courses in the major have a significant laboratory component. Students become very familiar with the instrumental tools of modern chemical investigation.

Undergraduate research has, and continues to be, the hallmark of the Chemistry Department. Over 200 students have had the opportunity to work side by side with University faculty in our summer research programs. Results of these studies are published in peer-reviewed professional journals with students included as co-authors. Over 75 such articles have been published since 1965 as part of the Chemistry Department undergraduate research program. Most importantly students learn to think like scientists as they tackle their own research project. Undergraduate research requires funding and the Chemistry faculty has been very successful in competing for public and

private grants (the total exceeds \$2 million). As remarkable evidence of loyalty and support, Department alumni also contribute nearly \$30,000 annually to partially fund the kind of research from which they themselves benefited. Students, faculty and alumni connect in significant ways to make the chemistry education at PLNU a respected and vital experience.

## *Career Opportunities*

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The professional success of our graduates attests to the quality of the Chemistry program. More than 80 percent of students who apply to medical schools are accepted (almost twice the national average). Higher percentages are accepted into Ph.D. programs in Chemistry and related fields. PLNU alumni can be found on the faculty of numerous medical schools and universities. They are also making important contributions in school classrooms and industrial labs. The same quality undergraduate education is offered to all our students, and the Department is proud of each achievement.

## *Majors*

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Biology-Chemistry  
Chemistry

## *Faculty*

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Sara Yu Choung, Ph.D.  
*University of California, Berkeley*

Victor L. Heasley, Ph.D.  
*University of Kansas*

Kenneth A. Martin, Ph.D., Chair  
*University of Kansas/Wichita State University*

Dale F. Shellhamer, Ph.D.  
*University of California, Santa Barbara*

## Biology- Chemistry (B.S.) *Major*

The interdepartmental major in Biology-Chemistry has been designed for those students whose academic needs and interests include both biology and chemistry. The major was instituted because a large segment of contemporary scientific investigation lies at the intersection of these two fields. Areas well served by this preparation include medicine, dentistry, and graduate disciplines, such as biochemistry, physiology, and molecular biology. This major earns a Bachelor of Science degree.

### LOWER-DIVISION REQUIREMENTS

COURSE #	TITLE	UNITS
BIO 210	Cell Biology and Biochemistry	.4
BIO 215	Animal Biology	.4
CHE 151	General Chemistry Tutorial*	.1
CHE 152	General Chemistry I	.4
CHE 153	General Chemistry II	.4
CHE 211	Analytical Chemistry	.2
CHE 295	Organic Chemistry I	.5
PHY 141	General Physics I <b>AND</b>	
PHY 142	General Physics II	.4
<b>OR</b>		
PHY 241	University Physics I <b>AND</b>	
PHY 242	University Physics II	.4
MTH 144	Calculus with Applications	.4
TOTAL		.36

\*May be waived by exam.

### UPPER-DIVISION REQUIREMENTS

COURSE #	TITLE	UNITS
BIO 345	Genetics	.4
BIO 380	Molecular Biology	.3
BIO 497	Biology Seminar	.1
CHE 300	Organic Chemistry II	.2
CHE 325	Physical Chemistry I	.5
CHE 351	Organic Qualitative Analysis	.2
CHE 466	Advanced Inorganic Chemistry	.2
CHE 326	Physical Chemistry II <b>OR</b>	
CHE 370	Instrumental Analysis <b>OR</b>	
CHE 453	Advanced Organic Chemistry	.2
BIO 450	Advanced Biochemistry <b>OR</b>	
CHE 450	Advanced Biochemistry	.4
<b>Three courses from:</b>		
BIO 300	Biomathematics and Bioinformatics	.3
BIO 315	Microbiology	.3
BIO 350	Advanced Cell Biology	.3
BIO 390	Immunology	.3
BIO 400	Developmental Biology	.3
BIO 420	Vertebrate Physiology	.3
TOTAL		.34

## Chemistry (B.S.) *Major*

### LOWER-DIVISION REQUIREMENTS

COURSE #	TITLE	UNITS
CHE 151	General Chemistry Tutorial*	.1
CHE 152	General Chemistry I	.4
CHE 153	General Chemistry II	.4
CHE 211	Analytical Chemistry	.2
CHE 295	Organic Chemistry I	.5
PHY 241	University Physics I	.4
PHY 242	University Physics II	.4
MTH 144	Calculus with Applications	.4
<b>AND</b>		
MTH 131	Computer-Aided Calculus	.1
<b>OR</b>		
MTH 164	Calculus I	.4
MTH 174	Calculus II	.4
TOTAL		.31-33

### UPPER-DIVISION REQUIREMENTS

COURSE #	TITLE	UNITS
CHE 300	Organic Chemistry II	.2
CHE 325	Physical Chemistry I	.5
CHE 326	Physical Chemistry II	.2
CHE 327	Physical Chemistry II Lab	.1
CHE 351	Organic Qualitative Analysis	.2
CHE 370	Instrumental Analysis	.2
CHE 450	Advanced Biochemistry	.4
CHE 453	Advanced Organic Chemistry	.2
CHE 454	Advanced Organic Chemistry Lab	.1
CHE 466	Advanced Inorganic Chemistry	.2
CHE 467	Advanced Inorganic Chemistry Lab	.1
CHE 475	Special Topics in Chemistry	.2
CHE 495	Chemistry Seminar	.1
Science and/or Math Electives approved by department chair. (200 level or higher)		
TOTAL		.33

### RECOMMENDED

COURSE #	TITLE	UNITS
CHE 499	Chemistry Research	.1-2
MTH 274	Calculus III	.4
MTH 232	Linear Algebra	.2