

# B.S. IN PHARMACEUTICAL PRODUCT DEVELOPMENT - PRE- PHARMACY CONCENTRATION

*College of the Sciences and Mathematics*

## Curriculum

Code	Title	Credits
<b>GENERAL EDUCATION REQUIREMENTS</b> ( <a href="http://catalog.wcupa.edu/undergraduate/general-education-requirements/">http://catalog.wcupa.edu/undergraduate/general-education-requirements/</a> )		
<b>Academic Foundations</b>		
	First Year Experience requirement	4
	English Composition requirement	6-7
	Mathematics requirement	3-4
MAT 121	Introduction to Statistics I	
or MAT 125	Introduction to Statistics and Probability	
	Interdisciplinary requirement	3
PHI 371	Medical Ethics	
	Diverse Communities requirement	3
	Ethics requirement	3
<b>Distributed Disciplinary Foundations</b>		
	Science requirement	6-8
	Behavioral & Social Science requirement	6
ECO 112	Principles of Economics (Micro)	
	Humanities requirement	6
	Arts requirement	3
<b>ADDITIONAL BACCALAUREATE REQUIREMENTS</b> ( <a href="http://catalog.wcupa.edu/undergraduate/general-education-requirements/">http://catalog.wcupa.edu/undergraduate/general-education-requirements/</a> )		
<b>University Requirements</b>		
	Writing Emphasis requirement	9
	Speaking Emphasis requirement	9
<b>Degree Requirements</b>		
	Capstone requirement	1-15
<b>MAJOR REQUIREMENTS</b>		
<b>Chemistry Requirements</b> <sup>2</sup>		
CHE 103	General Chemistry I	3
CHE 104	General Chemistry II	3
CHE 231	Organic Chemistry I	4
CHE 232	Organic Chemistry II	3
CHE 476	Biochemistry I	3
CRL 103	General Chemistry I Lab	1
CRL 104	General Chemistry II Lab	1
CRL 231	Organic Chemistry I Lab	2
CRL 232	Organic Chemistry II Lab	2
<b>Biology Requirements</b> <sup>2</sup>		
BIO 110	General Biology I <sup>1</sup>	4
BIO 210	Genetics	3
BIO 210L	Genetics Lab	1
BIO 211	Cell Biology	4
BIO 214	General Microbiology	4
BIO 333	Molecular Biology Techniques	2
BIO 367	Physiology of Drug Interactions	3
<b>Major Courses</b> <sup>2</sup>		
PPD 481	Drug Design I	3
PPD 482	Drug Design II	3

## Related/Cognate Requirements<sup>2</sup>

ENG 371	Technical Writing	3
or ENG 375	Strategies for Writing in the Workplace	
MAT 145	Calculus for the Life Sciences	3
or MAT 143	Brief Calculus	
or MAT 161	Calculus I	
PHY 130	General Physics I <sup>1</sup>	4
PHY 140	General Physics II	4
SPK 230	Business and Professional Speech Communication <sup>1</sup>	3

## Major Electives<sup>2</sup>

Courses are to be chosen from the following list in consultation with an advisor:		6
BIO 217	General Zoology	
BIO 310	Biostatistical Applications	
BIO 314	Pathogenic Microbiology	
BIO 334	Microbial Genetics	
BIO 357	Comparative Vertebrate Anatomy	
BIO 414	Applied and Industrial Microbiology	
BIO 421	Cellular and Molecular Biology	
BIO 428	Animal Histology	
BIO 431	Molecular Genetics	
BIO 440	Human Genetics	
BIO 443	Introduction to Gene Expression Methodology	
BIO 454	Mycology	
BIO 456	Virology	
BIO 464	Microbial Physiology	
BIO 465	Immunology	
BIO 468	Comparative Vertebrate Physiology	
BIO 469	Human Physiology	
BIO 484	Epidemiology	
BLA 201	Legal Environment of Business	
CHE 321	Analytical Chemistry I	
CHE 333	Advanced Organic Chemistry	
CHE 341	Physical Chemistry I	
CHE 342	Physical Chemistry II	
CHE 345	Physical Chemistry for the Life Sciences	
CHE 361	Forensic Chemistry I	
CHE 424	Advanced Analytical Chemistry	
CHE 436	Polymer Chemistry	
CHE 477	Biochemistry II	
CHE 479	Chemical Toxicology	
CHE 535	Pharmaceutical Chemistry	
CRL 321	Analytical Chemistry I Lab	
CRL 341	Physical Chemistry I Lab	
CRL 424	Analytical Chemistry II Lab	
CRL 436	Polymer Chemistry Lab	
CRL 476	Biochemistry I Lab	
CRL 477	Biochemistry II Lab	
ECO 111	Principles of Economics (Macro)	
ECO 370	The Economics of Health Care	
HEA 377	Pharmacology	
MAT 162	Calculus II	
MAT 261	Calculus III	
STA 200	Introduction to Statistics II	

STA 311	Intro Statistical Computing and Data Management	
STA 319	Applied Statistics	
MAT 421	Mathematical Statistics I	
MAT 422	Mathematical Statistics II	
MKT 250	Principles of Marketing	
PPD 484	Pharmaceutical Internship I	
PPD 485	Pharmaceutical Internship II	
PPD 490	Special Topics in Drug Development	
PPD 535	Pharmaceutical Chemistry	

<b>Concentration Requirements</b>		
Courses required for fulfillment of the concentration.		8
<b>Capstone Requirement<sup>2</sup></b>		
PPD 483	Drug Design III <sup>3</sup>	3
<b>Total Minimum Credits Required</b>		<b>120</b>

### Pre-Pharmacy Concentration

Code	Title	Credits
<b>Required Courses<sup>2</sup></b>		
BIO 259	Human Anatomy and Physiology I	4
BIO 269	Human Anatomy and Physiology II	4

<sup>1</sup> This course also satisfies the general education requirement.

<sup>2</sup> A grade of C- or better is necessary in all required science and mathematics courses.

<sup>3</sup> This course fulfills the Capstone requirement.

### Sample Course Plan

- See undergraduate admissions information. (<http://catalog.wcupa.edu/general-information/admissions-enrollment/undergraduate-admissions/>)
- See academic policies. (<http://catalog.wcupa.edu/undergraduate/academic-policies-procedures/>)

All undergraduate students are held to the academic policies and procedures outlined in the undergraduate catalog. Students are encouraged to review departmental handbooks for program tips, suggested course sequences, and explanations of procedures. When applicable, additional policies for specific department programs may be listed below.

Course	Title	Credits
<b>Year One</b>		
<b>Fall</b>		
BIO 110	General Biology I	4
CHE 103 & CRL 103	General Chemistry I and General Chemistry I Lab	4
MAT 121	Introduction to Statistics I	3
or MAT 125	or Introduction to Statistics and Probability	
FYE 100X	First Year Experience	4
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
BIO 210 & 210L	Genetics and Genetics Lab	4
CHE 104 & CRL 104	General Chemistry II and General Chemistry II Lab	4
WRT 120	Effective Writing I	3
Humanities Gen Ed		3
<b>Credits</b>		<b>14</b>

<b>Year Two</b>		
<b>Fall</b>		
CHE 231 & CRL 231	Organic Chemistry I and Organic Chemistry I Lab	6
BIO 214	General Microbiology	4
WRT 2XX	200-Level WRT Course	3
Arts Gen Ed		3

**Credits 16**

<b>Spring</b>		
BIO 211	Cell Biology	4
BIO 333	Molecular Biology Techniques	2
CHE 232	Organic Chemistry II	3
PPD 481	Drug Design I	3
BIO 259	Human Anatomy and Physiology I	4

**Credits 16**

<b>Year Three</b>		
<b>Fall</b>		
PPD 482	Drug Design II	3
BIO 269	Human Anatomy and Physiology II	4
PHY 130	General Physics I	4
MAT 143	Brief Calculus	3-4
or MAT 145	or Calculus for the Life Sciences	
or MAT 161	or Calculus I	

CRL 232	Organic Chemistry II Lab	2
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**Credits 16-17**

<b>Spring</b>		
PPD 483	Drug Design III	3
BIO 367	Physiology of Drug Interactions	3
PHY 140	General Physics II	4
ENG 371	Technical Writing	3
or ENG 375	or Strategies for Writing in the Workplace	
Student Elective		3

**Credits 16**

<b>Year Four</b>		
<b>Fall</b>		
CHE 476	Biochemistry I	3
ECO 112	Principles of Economics (Micro)	3
PHI 371	Medical Ethics	3
PPD 490	Special Topics in Drug Development <sup>1</sup>	0-1
Humanities Gen Ed		3
Behavioral & Social Science Gen Ed		3

**Credits 15-16**

<b>Spring</b>		
SPK 230	Business and Professional Speech Communication	3
PPD XXX	Elective	3
PPD XXX	Elective	3
Diverse Communities Gen		3
Student Elective <sup>1</sup>		0-3

**Credits 12-15**

**Total Credits 120-125**

<sup>1</sup> This course is optional.