

Cleveland State University  
College of Sciences and Health Professions  
Bachelor of Science in Pharmaceutical Sciences  
(Medicinal and Biological Chemistry Track)

**First Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 261/266 General Chemistry I/Lab	5	X	NS	CHM 262/267 General Chemistry II/Lab	5	X	NS
BIO 200/201 Introductory Biology I/Lab	4	X	NS	BIO 202/203 Introductory Biology II/Lab	4	X	NS
ENG 101 English I	3		W/C	ENG 102 English II	3		W/C
ASC 101 Introduction to University Life	1		INTRO	Arts & Humanities Elective*	3 to 4		A&H
Social Science Elective*	3 to 4		SS				
<b>Semester Total</b>	<b>16 to 17</b>			<b>Semester Total</b>	<b>15 to 16</b>		

**Second Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 331/336 Organic Chemistry I/Lab	6	X		CHM 332/337 Organic Chemistry II/Lab	6	X	
MTH 181 Calculus I	4	X	M/QL	MTH 182 Calculus II	4	X	M/QL
PHY 221 College Physics I	5	X	NS	PHY 222 College Physics II	5	X	NS
BIO 266/267 Anatomy & Physiology I/Lab	4	X	NS	BIO 268/269 Anatomy & Physiology II/Lab	4	X	NS
<b>Semester Total</b>	<b>19</b>			<b>Semester Total</b>	<b>19</b>		

**Third Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 341 Pharmacology I	3	X		CHM 342 Pharmacology II	3	X	
CHM 351 Medicinal Chemistry I	3	X		CHM 352 Medicinal Chemistry II	3	X	
CHM 402 Biochemistry	3	X		BIO 310/311 Genetics and Recitation	4	X	
CHM 310 Survey of Analytical Chemistry	2	X		CHM 405 Analytical Toxicology	3	X	
CHM 315 Survey of Analytical Chemistry Lab	2	X		African American Experience Elective*	3 to 4		DIV
US Diversity Elective*	3 to 4		DIV				
<b>Semester Total</b>	<b>16 to 17</b>			<b>Semester Total</b>	<b>16 to 17</b>		

**Fourth Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
BIO 308/309 Cell Biology/Lab	4	X		CHM 472 Student Colloquium	1	X	CAP
BIO 432 Molecular Genetics	3	X		CHM 455 Biotechnology Techniques	4	X	
CHM/BIO Elective (300/400 level)*	3 to 4	X		CHM 449/489 Practicum/Senior Research	4	X	
Social Science (outside the US/ALAAME)*	3 to 4		SS	CHM/BIO Elective (300/400 level)*	3 to 4	X	
				Arts & Humanities Elective (outside the US/ALAAME)*	3 to 4	X	A&H
<b>Apply for Spring graduation prior to Sep 9th</b>							
<b>Semester Total</b>	<b>13 to 15</b>			<b>Semester Total</b>	<b>15 to 17</b>		
<b>Degree Total: 129-137</b>							

Assumptions: college-level readiness in MTH & ENG; no Foreign Language Deficiency

**College/ Program Notes:**

The plan above is a suggested guide to ensure that all General Education, College, University, and Major requirements are met within 4 years of study. Students may deviate from the suggested placement of Gen Ed courses, although the M/QL and W/C requirements should be completed during the first year of study.

\*THREE of these electives must also double-count as WAC courses in order to avoid having to add additional courses to what is listed above. In addition, students must accumulate the minimum credit hour totals needed for graduation. Students must have a **minimum of 128 total credit hours**, of which a **minimum of 42 credit hours** must be upper division (300 or 400-level courses). Depending upon other elective choices made (3 credit hour vs. 4 credit hour courses), students may need additional electives.

**University Notes:**

<b>Gen Ed Key:</b>	SS = Social Sciences (two courses, one of which must be focused outside the US**)
INTRO = Introduction to University Life (one course)	A&H = Arts & Humanities (two courses, one must be focused outside the US**)
W/C = Writing/Composition (two courses; C or better required)	DIV = Social Diversity (two courses; one US Diversity and one African American Experience)
M/QL = Mathematics/Quantitative Literacy (two courses)	WAC/SPAC = Writing/Speaking Across the Curriculum (three courses, one in the major; C or better required)
NS = Natural Sciences (two courses, one of which must have a lab)	CAP = Capstone
	** of the SS and A&H courses focused outside the US, one must be focused on Africa, Latin America, Asia or the Middle East (ALAAME)

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**Cleveland State University**  
**College of Sciences and Health Professions**  
**Bachelor of Science in Pharmaceutical Sciences**  
(Pharmaceutical Chemistry and Analysis Track)

**First Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 261/266 General Chemistry I/Lab	5	X	NS	CHM 262/267 General Chemistry II/Lab	5	X	NS
BIO 200/201 Introductory Biology I/Lab	4	X	NS	BIO 202/203 Introductory Biology II/Lab	4	X	NS
ENG 101 English I	3		W/C	ENG 102 English II	3		W/C
ASC 101 Introduction to University Life	1		INTRO	Arts & Humanities Elective*	3 to 4		A&H
Social Science Elective*	3 to 4		SS				
<b>Semester Total</b>	<b>16 to 17</b>			<b>Semester Total</b>	<b>15 to 16</b>		

**Second Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 331/336 Organic Chemistry I/Lab	6	X		CHM 332/337 Organic Chemistry II/Lab	6	X	
MTH 181 Calculus I	4	X	M/QL	MTH 182 Calculus II	4	X	M/QL
PHY 221 College Physics I	5	X	NS	PHY 222 College Physics II	5	X	NS
BIO 266/267 Anatomy & Physiology I/Lab	4	X	NS	BIO 268/269 Anatomy & Physiology II/Lab	4	X	NS
<b>Semester Total</b>	<b>19</b>			<b>Semester Total</b>	<b>19</b>		

**Third Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 341 Pharmacology I	3	X		CHM 342 Pharmacology II	3	X	
CHM 351 Medicinal Chemistry I	3	X		CHM 352 Medicinal Chemistry II	3	X	
CHM 402 Biochemistry	3	X		CHM 411 Instrumental Analysis	3	X	
CHM 311/316 Quantitative Analysis/Lab	6	X		CHM 416 Instrumental Analysis Lab	4	X	WAC
				US Diversity Elective*	3 to 4		DIV
<b>Semester Total</b>	<b>15</b>			<b>Semester Total</b>	<b>16 to 17</b>		

**Fourth Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 320 Survey of Physical Chemistry	4	X		CHM 472 Student Colloquium	1	X	CAP
CHM 444 Pharmacokinetics	3	X		CHM 455 Biotechnology Techniques	4	X	
BIO 308/309 Cell Biology/Lab	4	X		CHM 449/489 Practicum/Senior Research	4	X	
Social Science (outside the US/ALAAME)*	3 to 4		SS	African American Experience Elective*	3 to 4		DIV
				Arts & Humanities Elective (outside the US/ALAAME)*	3 to 4	X	A&H
<b>Semester Total</b>	<b>14 to 15</b>			<b>Semester Total</b>	<b>15 to 17</b>		
<b>Apply for Spring graduation prior to Sep 9th</b>							
<b>Semester Total</b>				<b>Semester Total</b>			
<b>14 to 15</b>				<b>15 to 17</b>			
<b>Degree Total: 129-135</b>							

Assumptions: college-level readiness in MTH & ENG; no Foreign Language Deficiency

**College/ Program Notes:**

The plan above is a suggested guide to ensure that all General Education, College, University, and Major requirements are met within 4 years of study. Students may deviate from the suggested placement of Gen Ed courses, although the M/QL and W/C requirements should be completed during the first year of study.

\* **TWO** of these Gen Ed electives must also double-count as WAC courses in order to avoid having to add additional courses to what is listed above. In addition, students must accumulate the minimum credit hour totals needed for graduation. Students must have a **minimum of 128 total credit hours**, of which a **minimum of 42 credit hours** must be upper division (300 or 400-level courses). Depending upon other elective choices made (3 credit hour vs. 4 credit hour courses), students may need additional electives.

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W/C = Writing/Composition (two courses; C or better required)	DIV = Social Diversity (two courses; one US Diversity and one African American Experience)
M/QL = Mathematics/Quantitative Literacy (two courses)	WAC/SPAC = Writing/Speaking Across the Curriculum (three courses, one in the major; C or better required)
NS = Natural Sciences (two courses, one of which must have a lab)	CAP = Capstone
	** of the SS and A&H courses focused outside the US, one must be focused on Africa, Latin America, Asia or the Middle East (ALAAME)

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**Cleveland State University**  
**College of Sciences and Health Professions**  
**Bachelor of Science in Pharmaceutical Sciences**  
 (Pharmacy Administration Track - Even Year Start)

**First Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 261/266 General Chemistry I/Lab	5	X	NS	CHM 262/267 General Chemistry II/Lab	5	X	NS
BIO 200/201 Introductory Biology I/Lab	4	X	NS	BIO 202/203 Introductory Biology II/Lab	4	X	NS
ENG 101 English I	3		W/C	ENG 102 English II	3		W/C
ASC 101 Introduction to University Life	1		INTRO	Arts & Humanities Elective*	3 to 4		A&H
<b>Semester Total</b>	<b>13</b>			<b>Semester Total</b>	<b>15 to 16</b>		

**Second Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 331/336 Organic Chemistry I/Lab	6	X		CHM 332/337 Organic Chemistry II/Lab	6	X	
MTH 148 Mathematics for Business Majors I	4	X	M/QL	MTH 149 Mathematics for Business Majors II	4	X	M/QL
PHY 221 College Physics I	5	X	NS	PHY 222 College Physics II	5	X	NS
BIO 266/267 Anatomy & Physiology I/Lab	4	X	NS	BIO 268/269 Anatomy & Physiology II/Lab	4	X	NS
<b>Semester Total</b>	<b>19</b>			<b>Semester Total</b>	<b>19</b>		

**Third Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 341 Pharmacology I	3	X		CHM 342 Pharmacology II	3	X	
CHM 402 Biochemistry	3	X		ACT 222 Accounting II	3	X	
CHM/BIO Elective (300/400 level)*	3 to 4	X		ECN 202 Principles of Microeconomics	3	X	SS
ACT 221 Accounting I	3	X		CHM 401 Chemical Information	2	X	WAC
ECN 201 Principles of Macroeconomics	3	X	SS	Writing Across the Curriculum Elective	3 to 4		WAC
<b>Semester Total</b>	<b>15 to 16</b>			<b>Semester Total</b>	<b>14 to 15</b>		

**Fourth Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
FIN 351 Introduction to Financial Management	4	X		CHM 472 Student Colloquium	1	X	CAP
MKT 301 Introduction to Marketing	3	X		CHM 449 Practicum	4	X	
OSM 201 Business Statistics I	3	X	M/QL	OSM 202 Business Statistics II	3	X	M/QL
African American Experience Elective*	3 to 4		DIV	Social Science (outside the US/ALAAME)*	3 to 4		SS
Arts & Humanities Elective (outside the US/ALAAME)*	3 to 4	X	A&H	US Diversity Elective*	3 to 4		DIV
<b>Apply for Spring graduation prior to Sep 9th</b>							
<b>Semester Total</b>	<b>16 to 18</b>			<b>Semester Total</b>	<b>14 to 16</b>		
<b>Degree Total: 125-132 (128 hours minimum)</b>							

Assumptions: college-level readiness in MTH & ENG; no Foreign Language Deficiency

**College/ Program Notes:**

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\*ONE of these electives must also double-count as WAC courses in order to avoid having to add additional courses to what is listed above. In addition, students must accumulate the minimum credit hour totals needed for graduation. Students must have a **minimum of 128 total credit hours**, of which a **minimum of 42 credit hours** must be upper division (300 or 400-level courses). Depending upon other elective choices made (3 credit hour vs. 4 credit hour courses), students may need additional electives.

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**Cleveland State University**  
**College of Sciences and Health Professions**  
**Bachelor of Science in Pharmaceutical Sciences**  
(Pharmacy Administration Track - Odd Year Start)

**First Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 261/266 General Chemistry I/Lab	5	X	NS	CHM 262/267 General Chemistry II/Lab	5	X	NS
BIO 200/201 Introductory Biology I/Lab	4	X	NS	BIO 202/203 Introductory Biology II/Lab	4	X	NS
ENG 101 English I	3		W/C	ENG 102 English II	3		W/C
ASC 101 Introduction to University Life	1		INTRO	Arts & Humanities Elective*	3 to 4		A&H
<b>Semester Total</b>	<b>13</b>			<b>Semester Total</b>	<b>15 to 16</b>		

**Second Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 331/336 Organic Chemistry I/Lab	6	X		CHM 332/337 Organic Chemistry II/Lab	6	X	
MTH 148 Mathematics for Business Majors I	4	X	M/QL	MTH 149 Mathematics for Business Majors II	4	X	M/QL
PHY 221 College Physics I	5	X	NS	PHY 222 College Physics II	5	X	NS
BIO 266/267 Anatomy & Physiology I/Lab	4	X	NS	BIO 268/269 Anatomy & Physiology II/Lab	4	X	NS
<b>Semester Total</b>	<b>19</b>			<b>Semester Total</b>	<b>19</b>		

**Third Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
CHM 341 Pharmacology I	3	X		CHM 342 Pharmacology II	3	X	
CHM 402 Biochemistry	3	X		ACT 222 Accounting II	3	X	
CHM/BIO Elective (300/400 level)*	3 to 4	X		ECN 202 Principles of Microeconomics	3	X	SS
ACT 221 Accounting I	3	X		US Diversity Elective*	3 to 4		DIV
ECN 201 Principles of Macroeconomics	3	X	SS	Writing Across the Curriculum Elective	3 to 4		WAC
<b>Semester Total</b>	<b>15 to 16</b>			<b>Semester Total</b>	<b>15 to 17</b>		

**Fourth Year**

Fall Semester	Credits	Major	Gen Ed	Spring Semester	Credits	Major	Gen Ed
FIN 351 Introduction to Financial Management	4	X		CHM 472 Student Colloquium	1	X	CAP
MKT 301 Introduction to Marketing	3	X		CHM 449 Practicum	4	X	
OSM 201 Business Statistics I	3	X	M/QL	CHM 401 Chemical Information	2	X	WAC
African American Experience Elective*	3 to 4		DIV	OSM 202 Business Statistics II	3	X	M/QL
Arts & Humanities Elective (outside the US/ALAAME)*	3 to 4	X	A&H	Social Science (outside the US/ALAAME)*	3 to 4		SS
<b>Apply for Spring graduation prior to Sep 9th</b>							
<b>Semester Total</b>	<b>16 to 18</b>			<b>Semester Total</b>	<b>13 to 14</b>		
<b>Degree Total: 125-132 (128 hours minimum)</b>							

Assumptions: college-level readiness in MTH & ENG; no Foreign Language Deficiency

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M/QL = Mathematics/Quantitative Literacy (two courses)	
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