# **Pharmaceutical Sciences BS**

#### **Overview**

The **Bachelor of Science in Pharmaceutical Sciences** is offered by the Department of Pharmaceutical Sciences at Temple University School of Pharmacy. It is designed to prepare graduates for entry-level positions within the pharmaceutical and biotechnology industries. This program also serves as a pathway to graduate study in pharmaceutical sciences and regulatory affairs or professional programs in pharmacy, medicine, dentistry, and other fields. It provides a solid science foundation and broad liberal arts education while preparing students for careers in the areas of research/laboratory work, quality control, and administration in pharmaceutics, biotechnology, and healthcare industries. The first two years of study are primarily based in Temple University's Main campus, with the remaining curriculum taught in the School of Pharmacy on the Health Sciences Campus.

This major is open to incoming first-year students. Current Temple students can declare this major if they have been admitted to Temple University and have completed, or are in the process of completing, the undergraduate major requirements.

The BS in Pharmaceutical Sciences is a 4-year, non-licensure, undergraduate bachelor's degree program, and does not qualify the student for state board examination to become a registered pharmacist.

#### Concentrations

Students in the BS in Pharmaceutical Sciences must select one of the following concentrations:

- Manufacturing and Manufacturing Compliance
- · Marketing and Sales
- Research
- · Pre-Pharmacy (PharmD)

The **Concentration in Manufacturing and Manufacturing Compliance** focuses on the production, quality control and regulatory adherence of pharmaceutical products. It covers Good Manufacturing Practices (GMP), process validation, quality assurance and regulatory requirements to ensure drug safety and efficacy. Students gain expertise in optimizing production processes while meeting strict industry standards and regulations.

The **Concentration in Marketing and Sales** focuses on strategies for promoting and distributing pharmaceutical products while ensuring compliance with industry regulations. Students learn about market analysis, branding, sales techniques and regulatory frameworks governing pharmaceutical advertising. This concentration prepares graduates for careers in pharmaceutical marketing, sales and product management.

The **Concentration in Research** provides a foundation in drug discovery, development and evaluation through scientific investigation. Students study pharmacology, pharmaceutics, medicinal chemistry and laboratory techniques to innovate and improve pharmaceutical products. This concentration prepares graduates for careers in biomedical research, drug formulation and pharmaceutical development.

The **Pre-Pharmacy Concentration** is a pathway for high school graduates pursuing the profession of pharmacy to complete the PharmD prerequisites and, at the end of their second year, enter the PharmD program in the School of Pharmacy at Temple, as part of the Early Assurance Program. Students interested in this path complete undergraduate coursework requirements in two years and receive conditional acceptance based on the completion of these requirements. If admitted, students move to the PharmD program after two years of undergraduate coursework in the School of Pharmacy. Students in the Pre-Pharmacy Concentration do not earn a bachelor's degree and instead work toward the PharmD. Learn more about PharmD and the School of Pharmacy at Temple.

Campus Locations: Main, Health Sciences

Program Code: PH-PS-BS

#### **Contact Information**

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These requirements are for students who matriculated in academic year 2025-2026. Students who matriculated prior to fall 2025 should refer to the Archives to view the requirements for their Bulletin year.

# **Summary of Requirements for the Degree**

- 1. University Requirements (120-127 total s.h.)
  - Students must complete all University requirements including those listed below.
  - All undergraduate students must complete at least two writing-intensive courses for a total of at least six credits at Temple as part of their major. The specific writing-intensive course options for this major are:

Code	Title	Credit
		Hours
SCTC 2396	Writing for Science and Technology (WI)	3
PS 3896	(Introduction to Medical Writing)	3

- Students must complete the General Education (GenEd) requirements.
  - See the General Education section of the *Undergraduate Bulletin* for the GenEd curriculum.
  - Students will satisfy the Quantitative Literacy (GQ) and Science and Technology (ST) requirements with required Math (Calculus) and Science (Biology and Chemistry) coursework.
- Students must satisfy general Temple University residency requirements.
- 2. School Requirements

All Pharmacy courses (PP and PS) must be completed at Temple.

#### Math and Science Requirements

Code	Title	Credit Hours
Chemistry		
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II (S)	
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	
CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I (F)	
Select one of the following:		4
CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II	
CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)	

Biology		
BIOL 1111	Introduction to Organismal Biology	4
or BIOL 1911	Honors Introduction to Organismal Biology	
Select one of the following:		4
BIOL 1112	Introduction to Biomolecules, Cells and Genomes	
or BIOL 1912	Honors Introduction to Biomolecules, Cells and Genomes	
BIOL 2112	Introduction to Cellular and Molecular Biology	
or BIOL 2912	Honors Introduction to Cellular and Molecular Biology	
Mathematics		
Select one of the following:		4
MATH 1031	Differential and Integral Calculus	
MATH 1041	Calculus I	
or MATH 1941	Honors Calculus I	
Physics		
Select one of the following:		4
PHYS 1021	Introduction to General Physics I	
PHYS 1061	Elementary Classical Physics I	
or PHYS 1961	Honors Elementary Classical Physics I	
PHYS 2021	General Physics I	
or PHYS 2921	Honors General Physics I	
Anatomy and Physiology		
Select one of the following:		3-4
KINS 1221	Principles of Anatomy and Physiology I	
KINS 1223	Human Anatomy and Physiology I	
Select one of the following:		3-4
KINS 1222	Principles of Anatomy and Physiology II	
KINS 1224	Human Anatomy and Physiology II	
Science and Technology		
SCTC 2396	Writing for Science and Technology (WI)	3
Total Credit Hours		41-43
Code	Title	Credit Hours
(F) - Fall only course		
(S) - Spring only course		

# **Pharmacy Requirements**

Code	Title	Credit
		Hours
PS 3011	Introduction to Pharmaceutical Sciences I	1
PS 3012	Introduction to Pharmaceutical Sciences II	1
PS 3145	Immunology/Biotechnology	3
PS 3151	Medicinal Chemistry I	4
PS 3161	Pharmaceutics I	3
PS 3162	Pharmaceutics II	3
PS 3164	Pharmacology I	4
PS 3265	Pharmacology II	3
PS 3318	Clinical Drug Development	3
PS 3896	(Introduction to Medical Writing)	3
PP 4254	(Biostatistics and Medical Literature Evaluation)	2
Total Credit Hours		30

# Required Concentrations in Manufacturing and Manufacturing Compliance, Marketing and Sales, and Research

Select one of the following concentrations (24-28 credits):

# **Manufacturing and Manufacturing Compliance Concentration**

Code	Title	Credit Hours
PS 3476	Toxicology and Good Laboratory Practices in Drug Development	3
PS 3477	Current Good Manufacturing Practices	3
PS 4261	Concepts in Pharmacogenomics	3
PS 4469	(Quality Systems and Operations)	3
PS 4512	(Microbiological Concepts in Pharmaceutical Manufacturing)	3
PS 4474	(Process Validation)	3
Concentration Electives		
Select two of the following:		6
PS 4003	(Preformulation - Small Molecules)	
PS 4004	(Solid Dosage Forms: Small Molecules)	
PS 4128	(Drug Discovery)	
PS 4262	Pharmacokinetics	
PS 4578	(High Purity Water Systems)	
PS 4622	(Unit Operations)	
PS 4629	(Process Monitoring)	
PS 4471	(Biotechnology: Bioprocess Basics)	
Total Credit Hours		24

#### **Marketing and Sales Concentration**

Code	Title	Credit Hours
PS 3472	(Pharmaceutical Marketing)	3
PS 3529	(Food and Drug Law)	3
PS 3532	(Global Labeling Regulations: Principles and Practices)	3
PS 3533	(Requirements for Product Labeling and Advertising)	3
PS 3611	(Regulation of Advertising and Promotions)	3
PP 4352	(Economics of Pharmacy Practice)	3
Concentration Electives		
Select two of the following:		6
PS 3408	(Pharmacoeconomics)	
PS 4003	(Preformulation - Small Molecules)	
PS 4004	(Solid Dosage Forms: Small Molecules)	
PS 4128	(Drug Discovery)	
PS 4261	Concepts in Pharmacogenomics	
PS 4262	Pharmacokinetics	
PS 4512	(Microbiological Concepts in Pharmaceutical Manufacturing)	
Total Credit Hours		24

#### **Research Concentration**

Code	Title	Credit Hours
PS 3002	(Pharmaceutical Analysis)	3
PS 4007	(Biopharmaceutics)	3
PS 4128	(Drug Discovery)	3
PS 4129	(Introduction to Research and Research Ethics)	2
PS 4201	(Pharmaceutical Sciences Department Seminar Series I)	1

<b>Total Credit Hours</b>		27-28
PS 4004	(Solid Dosage Forms: Small Molecules)	
PS 4003	(Preformulation - Small Molecules)	
PS 3152	Medicinal Chemistry II	
Select one of the following:		3-4
Concentration Elective		
PS 4512	(Microbiological Concepts in Pharmaceutical Manufacturing)	3
PS 4391	(Research)	2
PS 4262	Pharmacokinetics	3
PS 4261	Concepts in Pharmacogenomics	3
PS 4202	(Pharmaceutical Sciences Department Seminar Series II)	1

# **Suggested Academic Plan**

# **Bachelor of Science in Pharmaceutical Sciences**

# Suggested Plan for New Students Starting in the 2025-2026 Academic Year

#### **Years 1-2: All Concentrations**

Year 1		
Fall		Credit Hours
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
Select one of the following:		4
MATH 1031	Differential and Integral Calculus	
MATH 1041 or MATH 1941	Calculus I or Honors Calculus I	
ENG 0802 or ENG 0902	Analytical Reading and Writing [GW] or Honors Analytical Reading and Writing [GW]	4
GenEd Breadth Course		3
	Credit Hours	15
Spring		
BIOL 1111 or BIOL 1911	Introduction to Organismal Biology or Honors Introduction to Organismal Biology	4
Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952 & CHEM 1954	Honors General Chemical Science II and Honors Chemical Science Laboratory II (S)	
IH 0851 or IH 0951	Intellectual Heritage I: The Good Life [GY] or Honors Intellectual Heritage I: The Good Life [GY]	3
GenEd Breadth Course (GA)		3-4
	Credit Hours	14-15
Year 2		
Fall		
Select one of the following:		4
BIOL 1112 or BIOL 1912	Introduction to Biomolecules, Cells and Genomes or Honors Introduction to Biomolecules, Cells and Genomes	
BIOL 2112 or BIOL 2912	Introduction to Cellular and Molecular Biology or Honors Introduction to Cellular and Molecular Biology	
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I and Organic Chemistry Laboratory I	

CHEM 2921 & CHEM 2923	Organic Chemistry for Honors I and Organic Honors Laboratory I (F)	
Select one of the following:		3-4
KINS 1221	Principles of Anatomy and Physiology I	
KINS 1223	Human Anatomy and Physiology I	
SCTC 2396	Writing for Science and Technology [WI]	3
IH 0852	Intellectual Heritage II: The Common Good [GZ]	3
or IH 0952	or Honors Intellectual Heritage II: The Common Good [GZ]	
	Credit Hours	17-18
Spring		
Select one of the following:		4
CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II	
CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)	
Select one of the following:		4
PHYS 1021	Introduction to General Physics I	
PHYS 1061 or PHYS 1961	Elementary Classical Physics I or Honors Elementary Classical Physics I	
PHYS 2021 or PHYS 2921	General Physics I or Honors General Physics I	
Select one of the following:		3-4
KINS 1222	Principles of Anatomy and Physiology II	
KINS 1224	Human Anatomy and Physiology II	
GenEd Breadth Course		3
	Credit Hours	14-15
	Total Credit Hours	60-63
Code	Title	Credit Hours
(F) - Fall only course		
(S) - Spring only course		

## Years 3-4: Manufacturing and Manufacturing Compliance Concentration

Year 3		
Fall		Credit Hours
PS 3011	Introduction to Pharmaceutical Sciences I	1
PS 3145	Immunology/Biotechnology	3
PS 3151	Medicinal Chemistry I	4
PS 3161	Pharmaceutics I	3
PS 3318	Clinical Drug Development	3
GenEd Breadth Course		3
	Credit Hours	17
Spring		
PS 3012	Introduction to Pharmaceutical Sciences II	1
PS 3162	Pharmaceutics II	3
PS 3164	Pharmacology I	4
PS 3476	Toxicology and Good Laboratory Practices in Drug Development	3
PS 3477	Current Good Manufacturing Practices	3
	Credit Hours	14
Year 4		
Fall		
PS 3265	Pharmacology II	3
PS 4261	Concepts in Pharmacogenomics	3

PS 4474	Process Validation	3
Concentration Elective		3
GenEd Breadth Course		3
	Credit Hours	15
Spring		
PS 3896	Introduction to Medical Writing	3
PP 4254	Biostatistics and Medical Literature Evaluation	2
PS 4469	Quality Systems and Operations	3
PS 4512	Microbiological Concepts in Pharmaceutical Manufacturing	3
Concentration Elective		3
	Credit Hours	14
	Total Credit Hours	60

#### **Years 3-4: Marketing and Sales Concentration**

	Total Credit Hours	60
	Credit Hours	14
Concentration Elective		3
PP 4254	Biostatistics and Medical Literature Evaluation	2
PS 3896	Introduction to Medical Writing	3
PS 3533	Requirements for Product Labeling and Advertising	3
PS 3472	Pharmaceutical Marketing	3
Spring		
	Credit Hours	15
Concentration Elective		3
PP 4352	Economics of Pharmacy Practice	3
PS 3611	Regulation of Advertising and Promotions	3
PS 3529	Food and Drug Law	3
PS 3265	Pharmacology II	3
Fall		
Year 4	orough trouto	14
Sched Diedulii Course	Credit Hours	14
GenEd Breadth Course	Global Labeling Negulations. Filliciples and Flactices	3
PS 3532	Global Labeling Regulations: Principles and Practices	3
PS 3162 PS 3164	Pharmaceutics II Pharmacology I	3 4
PS 3012 PS 3162	Introduction to Pharmaceutical Sciences II Pharmaceutics II	1
Spring	Introduction to Phormacoutical Coloneas II	4
	Credit Hours	17
GenEd Breadth Course		3
PS 3318	Clinical Drug Development	3
PS 3161	Pharmaceutics I	3
PS 3151	Medicinal Chemistry I	4
PS 3145	Immunology/Biotechnology	3
PS 3011	Introduction to Pharmaceutical Sciences I	1
Fall		Credit Hours
Year 3		

#### **Years 3-4: Research Concentration**

Year 3		
Fall		Credit Hours
PS 3011	Introduction to Pharmaceutical Sciences I	1
PS 3145	Immunology/Biotechnology	3

	Total Credit Hours	63-64
	Credit Hours	17-18
Concentration Elective		3-4
PS 4512	Microbiological Concepts in Pharmaceutical Manufacturing	3
PS 4391	Research	2
PS 4262	Pharmacokinetics	3
PP 4254	Biostatistics and Medical Literature Evaluation	
PS 4202	Pharmaceutical Sciences Department Seminar Series II	
PS 3896	Introduction to Medical Writing	3
Spring	C. C	10
	Credit Hours	15
PS 4261	Concepts in Pharmacogenomics	3
PS 4201	Pharmaceutical Sciences Department Seminar Series I	1
PS 4129	Introduction to Research and Research Ethics	2
PS 4128	Drug Discovery	3
PS 4007	Biopharmaceutics	3
PS 3265	Pharmacology II	3
Fall		
Year 4	OF CUIT FIGURE	14
Geneu Breauth Course	Credit Hours	<u></u>
GenEd Breadth Course	гнаннасио <u>у</u> у г	3
PS 3162 PS 3164	Pharmaceutics II Pharmacology I	3
PS 3012 PS 3162	Pharmaceutics II	1
PS 3002	Pharmaceutical Analysis Introduction to Pharmaceutical Sciences II	3
Spring		
	Credit Hours	17
GenEd Breadth Course		3
PS 3318	Clinical Drug Development	3
PS 3161	Pharmaceutics I	3
PS 3151	Medicinal Chemistry I	4

# **Pre-Pharmacy Program**

The Pre-Pharmacy concentration provides a clear pathway for students interested in the PharmD to complete the prerequisite courses as Temple undergraduate students followed by the professional curriculum in as little as 6 years. This is part of the PharmD Early Assurance Program (EAP). A minimum of 60 credit hours of prerequisites are required to enter the PharmD program.

These requirements are for students who matriculated in academic year 2025-2026. Students who matriculated prior to fall 2025 should refer to the Archives to view the requirements for their Bulletin year.

# **Summary of Requirements**

The Doctor of Pharmacy (PharmD) degree may be conferred upon a student by recommendation of the faculty upon completion of the 140 credit hours of professional courses. To enter the PharmD program, students must complete a minimum of 60 credit hours of prerequisite courses. Overall GPA and science GPA must be at least 2.7 (on a 4.0 scale). All prerequisite courses must be completed with a minimum grade of C- on the first attempt. General Education requirements, with the exception of ENG 0802, are waived. However, students must complete a minimum of 18 credit hours of electives, which may consist of General Education courses, and include courses in Intellectual Heritage, Anthropology, Criminal Justice, Geography, History, Political Science, Psychology, Religion, Sociology, Literature/Classics, Architecture, Fine Arts/Performing Arts, Languages, Literature, Philosophy, Communication/Public Speaking, and/or Statistics. Please confer with the advising staff and review your DARS for further information.

### **Prerequisite Requirements**

Code	Title	Credit
		Hours
English		4
ENG 0802	Analytical Reading and Writing	

New York   Select One of the following:			
Chemistry         Select one of the following:         4           CHEM 1031         General Chemistry I and General Chemistry I and General Chemistry Laboratory I (HEM 1051)         Honors General Chemistry Laboratory I (F)           CHEM 1951         Honors General Chemical Science I and Honors Chemical Science I and Honors Chemical Science Laboratory I (F)         4           Subtect one of the following:         4           CHEM 1032         General Chemistry I and General Chemistry I (F)         4           Subtect one of the following:         4           CHEM 1952         Honors General Chemistry Laboratory II (S)         4           Subtect one of the following:         4           CHEM 1952         Organic Chemistry I and Honors Chemical Science II and Honors I and Honors I and Honors I and Organic Chemistry Laboratory I         4           CHEM 2201         Organic Chemistry I and Organic Property I (F)         4           Subtect one of the following:         4         4           CHEM 22023         and Organic Chemistry I and Organic Property II and Organic Chemistry I and	or ENG 0812	Analytical Reading and Writing: ESL	
Select one of the following:		Honors Analytical Reading and Writing	
CHEM 1031   General Chemistry   A CHEM 1033   and General Chemistry Laboratory   CHEM 1951   A CHEM 1951   And General Chemical Science   A CHEM 1953   And General Chemical Science   A CHEM 1953   And General Chemical Science   A CHEM 1032   General Chemical Science   A CHEM 1034   A CHEM 1034   And General Chemistry Laboratory   B CHEM 1035   A CHEM 1034   And General Chemistry   B CHEM 1035   A CHEM 1954   And General Chemistry Laboratory   B CHEM 1954   A CHEM 1955   And Honors Chemistry Laboratory   B CHEM 2031   And Honors Chemistry Laboratory   B CHEM 2031   And Honors Chemistry Laboratory   B CHEM 2031   And Honors Chemistry   A CHEM 2031   And Honors Chemistry Laboratory   CHEM 2031   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2032   Organic Chemistry Laboratory   CHEM 2032   A CHEM 2032   Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory   CHEM 2032   A CHEM 2034   And Organic Chemistry Laboratory	·		
6. CHEM 1033         and General Chemistry Laboratory I           6. CHEM 1953         and Honors Chemical Science I           8. CHEM 1953         and Honors Chemical Science Laboratory I (F)           Saluct one of the following:         4           CHEM 1032         General Chemistry I and General Chemistry I Honors Chemical Science II           CHEM 1952         Honors General Chemical Science II           8. CHEM 1954         and Honors Chemical Science Laboratory II (S)           Select one of the following:         4           CHEM 2001         Organic Chemistry I and Organic Chemistry Laboratory II (S)           CHEM 2201         Organic Chemistry I or Honors I and Organic Honors Laboratory II (F)           Select one of the following:         4           CHEM 2202         Organic Chemistry Laboratory II (F)           Select one of the following:         4           CHEM 2202         Organic Chemistry Laboratory II (F)           CHEM 2202         Organic Chemistry II (S)           Biology         4           BIOL 1111         Introduction to Organismal Biology         4           BIOL 1112         Introduction to Organismal Biology         4           BIOL 2112         Introduction to Eliular and Molecular Biology         4           Marchamates         Flore Calculus I         4			4
& CHEM 1953         and Honors Chemical Science Laboratory I (F)           Select on on of the following:         4           CHEM 1032         General Chemistry II           & CHEM 1954         and General Chemistry Laboratory II           CHEM 1952         Honors General Chemistry Science Laboratory II (S)           Select one of the following:         4           CHEM 2201         Organic Chemistry I organic Chemistry Laboratory I           CHEM 2231         Organic Chemistry For Honors I           & CHEM 2292         Organic Chemistry I organic Chemistry II           CHEM 2202         Organic Chemistry II organic Chemistry II           CHEM 2204         and Organic Chemistry I Laboratory II           CHEM 2205         Organic Chemistry I Laboratory II           CHEM 2204         and Organic Chemistry I Laboratory II (S)           BIOL 1111         Introduction to Organismal Biology           BIOL 1112         Introduction to Dignismal Biology           BIOL 1112         Introduction to Elimonecules, Cells and Genomes           BIOL 2112         Honors Introduction to Elimonecules, Cells and Genomes           BIOL 2112         Introduction to Cellular and Molecular Biology           Asterior en of the following:         4           MaTH 1031         Differential and Integral Calculus           Phys			
CHEM 1932			
& CHEM 1034         and General Chemistry Laboratory II           CHEM 1952         Honors General Chemieal Science II           & CHEM 1954         and Honors Chemical Science Laboratory II (S)           Select one of the following:         4           CHEM 2201         Organic Chemistry I           & CHEM 2203         and Organic Chemistry Laboratory I           & CHEM 2923         and Organic Chemistry II           & CHEM 2920         Organic Chemistry II           & CHEM 2202         Organic Chemistry II           & CHEM 2203         and Organic Chemistry II           & CHEM 2204         and Organic Chemistry II           & CHEM 2202         Organic Chemistry II           & CHEM 2203         and Organic Chemistry II           & CHEM 2204         and Organic Chemistry II           & CHEM 2204         and Organic Chemistry II           & CHEM 2204         and Organic Chemistry II           BIOL 1111         Introduction to Organismal Biology           BIOL 1911         Horosten Introduction to Organismal Biology           BIOL 1911         Horosten Introduction to Organismal Biology           BIOL 1912         Introduction to Cellular and Molecules, Cells and Genomes           BIOL 1912         Horosten Introduction to Cellular and Molecules Biology           Mathem	Select one of the following:		4
CHEM 1954			
Select one of the following:         4           CHEM 2201         Organic Chemistry I and Organic Chemistry I and Organic Chemistry Laboratory I           CHEM 2203         and Organic Chemistry For Honors I and Organic Chemistry I organic Chemistry II and Organic Chemistry II II and Organic Chemistry II II and Organic Chemistry II II II II and Organic Chemistry II		Honors General Chemical Science II	
CHEM 2201	Select one of the following:	(-)	4
& CHEM 2203         and Organic Chemistry for Honors I           CHEM 2921         Organic Chemistry for Honors I and Organic Honors Laboratory I (F)           Select one of the following:         4           CHEM 2204         Organic Chemistry I Laboratory II (CHEM 2204)         and Organic Chemistry Laboratory II (CHEM 2204)           & CHEM 2924         Organic Chemistry For Honors II Raboratory II (S)         ACHEM 2924           & CHEM 2924         and Organic Honors Laboratory II (S)           BIOL 1111         Introduction to Organismal Biology           & FOLL 1911         Honors Introduction to Organismal Biology           Select one of the following:         4           BIOL 1912         Introduction to Dismolecules, Cells and Genomes           or BIOL 1912         Honors Introduction to Gellular and Molecular Biology           or BIOL 2912         Honors Introduction to Cellular and Molecular Biology           Mathematics         4           Select one of the following:         4           MATH 1031         Differential and Integral Calculus           MATH 1041         Calculus I           or MATH 1941         Honors Calculus I           PHYS 1061         Elementary Classical Physics I           or PHYS 1961         Honors Elementary Classical Physics I           or PHYS 1961         General Physics		Organic Chemistry I	
& CHEM 2923         and Organic Honors Laboratory I (F)           Select one of the following:         4           CHEM 2204         and Organic Chemistry Laboratory II           CHEM 2924         and Organic Chemistry for Honors II           & CHEM 2924         and Organic Honors Laboratory II (S)           BIOL 2925         and Organic Honors Laboratory II (S)           BIOL 2011         Introduction to Organismal Biology           or BIOL 1911         Honors Introduction to Organismal Biology           Select one of the following:         4           BIOL 1912         Honors Introduction to Biomolecules, Cells and Genomes           or BIOL 1912         Honors Introduction to Biomolecules, Cells and Genomes           BIOL 2912         Introduction to Cellular and Molecular Biology           or BIOL 2912         Introduction to Cellular and Molecular Biology           MATH 1031         Differential and Integral Calculus           MATH 1031         Calculus I           MATH 1041         Calculus I           or MATH 1941         Honors Celculus I           Physics         PHYS 1061           Elect one of the following:         A           PHYS 1081         Elementary Classical Physics I           PHYS 1081         General Physics I           or PHYS 1981         <	& CHEM 2203	and Organic Chemistry Laboratory I	
CHEM 2202         Organic Chemistry II           & CHEM 2204         and Organic Chemistry Laboratory II           CHEM 2922         Organic Chemistry To Honors II           & CHEM 2924         and Organic Honors Laboratory II (S)           BIOL 999           BIOL 1111         Introduction to Organismal Biology         4           or BIOL 1911         Honors Introduction to Organismal Biology         4           Select one of the following:         4           BIOL 1912         Introduction to Biomolecules, Cells and Genomes           BIOL 2112         Introduction to Cellular and Molecular Biology           or BIOL 2912         Honors Introduction to Cellular and Molecular Biology           are BIOL 2912         Honors Introduction to Cellular and Molecular Biology           biol 2912         Honors Introduction to Cellular and Molecular Biology           biol 2912         Honors Introduction to Cellular and Molecular Biology           biol 2912         Honors Introduction to Cellular and Molecular Biology           biol 2912         Honors Introduction to Cellular and Molecular Biology           biol 2912         Honors Calculus I           biol 2912         Honors Calculus I           biol 2912         Honors Calculus I           biol 2913         Honors Calculus I           ph			
& CHEM 2204 and Organic Chemistry Laboratory II CHEM 2922 Organic Chemistry for Honors II & CHEM 2924 and Organic Chemistry for Honors II & CHEM 2924 AND ORGANIC CHEMISTRY OF HONORS II & CHEM 2924 AND ORGANIC CHEMISTRY OF HONORS IN (S)  BIOL 1111 Introduction to Organismal Biology Select one of the following: BIOL 1911 Honors Introduction to Organismal Biology Select one of the following: Introduction to Biomolecules, Cells and Genomes BIOL 1112 Introduction to Biomolecules, Cells and Genomes BIOL 1112 Introduction to Cellular and Molecular Biology Or BIOL 2912 Honors Introduction to Cellular and Molecular Biology  Mathematics Select one of the following: AMATH 1031 Differential and Integral Calculus MATH 1041 Calculus I ORATH 1941 Honors Calculus I PHYS 1021 Introduction to General Physics I PHYS 1021 Introduction to General Physics I PHYS 1021 General Physics I OPHYS 2921 Honors General Physics I OPHYS 2921 General Physics I OPHYS 2921 Honors General Physics I OPHYS 2921	Select one of the following:		4
& CHEM 2924         and Organic Honors Laboratory II (S)           Biology           BIOL 1111         Introduction to Organismal Biology           6 or BIOL 1911         Honors Introduction to Organismal Biology           Select one of the following:         4           BIOL 1112         Introduction to Biomolecules, Cells and Genomes           BIOL 1912         Honors Introduction to Biomolecules, Cells and Genomes           BIOL 2912         Honors Introduction to Cellular and Molecular Biology           or BIOL 2912         Honors Introduction to Cellular and Molecular Biology           Mathematics           Select one of the following:           MATH 1031         Differential and Integral Calculus           MATH 1041         Calculus I           Or MATH 1941         Honors Calculus I           Physics           Select one of the following:         4           Physics I           Phys 1021         Introduction to General Physics I           PHYS 2021         General Physics I           A select one of the following:         General Physics I           A select one of the following:         7-4           KINS 1223         Human Anatomy and Physiology I		•	
Biology  Biol 1111 Introduction to Organismal Biology or BIOL 1911 Honors Introduction to Organismal Biology  Select one of the following: BIOL 1112 Introduction to Biomolecules, Cells and Genomes or BIOL 1912 Honors Introduction to Biomolecules, Cells and Genomes BIOL 2912 Honors Introduction to Cellular and Molecular Biology or BIOL 2912 Honors Introduction to Cellular and Molecular Biology  Mathematics  Select one of the following: Select one of the following: MATH 1031 Differential and Integral Calculus MATH 1041 Calculus I ORDAN ACTION CALCULUS I ORDAN ACTION CALCULUS I PHYSIOS  Select one of the following: Selec	CHEM 2922	Organic Chemistry for Honors II	
BIOL 11111         Introduction to Organismal Biology         4           or BIOL 1911         Honors Introduction to Organismal Biology           Select one of the following:         4           BIOL 1112         Introduction to Biomolecules, Cells and Genomes           or BIOL 1912         Honors Introduction to Cellular and Molecular Biology           or BIOL 2912         Introduction to Cellular and Molecular Biology           Mathematics         Select one of the following:         4           MATH 1031         Differential and Integral Calculus           MATH 1041         Calculus I           or MATH 1941         Honors Calculus I           Physics           Select one of the following:         4           PHYS 1021         Introduction to General Physics I           PHYS 1961         Elementary Classical Physics I           or PHYS 1961         Honors Elementary Classical Physics I           PHYS 2021         General Physics I           or PHYS 2921         Honors General Physics I           KINS 1221         Honors General Physics I           KINS 1222         Principles of Anatomy and Physiology I           KINS 1223         Human Anatomy and Physiology II           KINS 1222         Principles of Anatomy and Physiology II	& CHEM 2924	and Organic Honors Laboratory II (S)	
Select one of the following:  BIOL 1112	Biology		
Select one of the following:         4           BIOL 1112         Introduction to Biomolecules, Cells and Genomes           BIOL 1912         Honors Introduction to Biomolecules, Cells and Genomes           BIOL 2912         Introduction to Cellular and Molecular Biology           or BIOL 2912         Honors Introduction to Cellular and Molecular Biology           Mathematics           Select one of the following:         4           MATH 1031         Differential and Integral Calculus           MATH 1041         Calculus I           or MATH 1941         Honors Calculus I           Physics           Select one of the following:         4           PhYS 1021           Introduction to General Physics I           PHYS 1061         Elementary Classical Physics I           or PHYS 1961         Honors Elementary Classical Physics I           or PHYS 2021         General Physics I           or PHYS 2021         General Physics I           at Nationary and Physiology           KINS 1221         Principles of Anatomy and Physiology I           KINS 1222         Principles of Anatomy and Physiology II           KINS 1222         Principles of Anatomy and Physiology II           KINS 1224 <td< td=""><td>BIOL 1111</td><td>Introduction to Organismal Biology</td><td>4</td></td<>	BIOL 1111	Introduction to Organismal Biology	4
BIOL 1112 Introduction to Biomolecules, Cells and Genomes or BIOL 1912 Honors Introduction to Biomolecules, Cells and Genomes BIOL 2112 Introduction to Cellular and Molecular Biology or BIOL 2912 Honors Introduction to Cellular and Molecular Biology  Mathematics  Select one of the following: Select one of the following: MATH 1031 Differential and Integral Calculus MATH 1041 Calculus I or MATH 1941 Honors Calculus I Physics  Select one of the following: PhyS 1021 Introduction to General Physics I PHYS 1021 Introduction to General Physics I PHYS 1061 Elementary Classical Physics I Or PHYS 2921 General Physics I Or PHYS 2921 Honors General Physics I Or PHYS 2921 Phonors General Physics I Or PHYS 2921 Phonors General Physics I Or PHYS 2921 Physics I Or PHYS 2921 Phonors General Physics I Or PHYS 2921 Phonors General Physics I Or PHYS 2921 Phonors General Physics I  Select one of the following: Select	or BIOL 1911	Honors Introduction to Organismal Biology	
or BIOL 1912 Honors Introduction to Biomolecules, Cells and Genomes BIOL 2112 Introduction to Cellular and Molecular Biology or BIOL 2912 Honors Introduction to Cellular and Molecular Biology  Mathematics  Select one of the following:	Select one of the following:		4
BIOL 2112 Introduction to Cellular and Molecular Biology  Mathematics  Select one of the following:  MATH 1031 Differential and Integral Calculus  MATH 1041 Calculus I  or MATH 1941 Honors Calculus I  or MATH 1941 Introduction to General Physics I  PHYS 1021 Introduction to General Physics I  or PHYS 1961 Elementary Classical Physics I  or PHYS 2021 General Physics I  or PHYS 2021 General Physics I  or PHYS 2021 General Physics I  or PHYS 2921 Honors General Physics I  or PHYS 2921 General Physics I  or PHYS 2921 Honors General Physics I  or PHYS 2921 Physics I  or PHYS 2921 Honors General Physics I  or PHYS 2921 Physics I  or PHYS 2921 Principles of Anatomy and Physiology I  KINS 1222 Principles of Anatomy and Physiology I  KINS 1222 Principles of Anatomy and Physiology II  KINS 1222 Principles of Anatomy and Physiology II  KINS 1224 Human Anatomy and Physiology II  Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 18	BIOL 1112	Introduction to Biomolecules, Cells and Genomes	
mathematics  Select one of the following: MATH 1031 Differential and Integral Calculus  MATH 1041 Or MATH 1941 Donors Calculus I  Physics  Select one of the following: 4 PHYS 1021 Introduction to General Physics I PHYS 1061 Or PHYS 1961 Deneral Physics I PHYS 2021 General Physics I PHYS 2021 General Physics I PHYS 2021 Or PHYS 2921 General Physics I PHYS 2921 Finciples of Anatomy and Physiology I KINS 1222 Human Anatomy and Physiology I KINS 1222 Frinciples of Anatomy and Physiology II KINS 1222 Frinciples of Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology I KINS 1224 Frinciples of Anatomy and Physiology II KINS 1224 Frinciples of Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology II KINS 1224 Frinciples of Anatomy and Physiology II KINS 1225 Social Sciences and Humanities Electives Select 6 courses for a minimum of 18 credits as follows:   18	or BIOL 1912	Honors Introduction to Biomolecules, Cells and Genomes	
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MATH 1031 Differential and Integral Calculus  MATH 1041 Calculus I	Mathematics		
MATH 1041 Calculus I or MATH 1941 Honors Calculus I  Physics  Select one of the following: 4 PHYS 1021 Introduction to General Physics I PHYS 1061 Elementary Classical Physics I or PHYS 1961 Honors Elementary Classical Physics I PHYS 2021 General Physics I or PHYS 2921 Honors General Physics I Anatomy and Physiology  Select one of the following: 3-4 KINS 1221 Principles of Anatomy and Physiology I KINS 1223 Human Anatomy and Physiology I Select one of the following: 3-4 KINS 1222 Principles of Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology II Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1 18	Select one of the following:		4
or MATH 1941 Honors Calculus I  Physics  Select one of the following: 4 PHYS 1021 Introduction to General Physics I PHYS 1061 Elementary Classical Physics I or PHYS 1961 Honors Elementary Classical Physics I PHYS 2021 General Physics I or PHYS 2921 Honors General Physics I Anatomy and Physiology  Select one of the following: 3-4 KINS 1221 Principles of Anatomy and Physiology I KINS 1223 Human Anatomy and Physiology I Select one of the following: 3-4 KINS 1222 Principles of Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology II Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1  Select 6 courses for a minimum of 18 credits as follows: 1  Select 6 courses for a minimum of 18 credits as follows: 1	MATH 1031	Differential and Integral Calculus	
Physics  Select one of the following:  PHYS 1021 Introduction to General Physics I  PHYS 1061 Elementary Classical Physics I  or PHYS 1961 Honors Elementary Classical Physics I  PHYS 2021 General Physics I  or PHYS 2921 Honors General Physics I  Anatomy and Physiology  Select one of the following:  KINS 1221 Principles of Anatomy and Physiology I  KINS 1223 Human Anatomy and Physiology I  Select one of the following:  Select one of the following:  Select one of the following:  Select one of the Select one of Select One One Select One	MATH 1041	Calculus I	
Select one of the following: PHYS 1021 Introduction to General Physics I PHYS 1061 Elementary Classical Physics I or PHYS 1961 Honors Elementary Classical Physics I PHYS 2021 General Physics I or PHYS 2921 Honors General Physics I Select one of the following: Select one of the following: Select one of the following: KINS 1221 Principles of Anatomy and Physiology I KINS 1223 Human Anatomy and Physiology I Select one of the following: Select one of the following: Select one of the following: Select Select one of the following: Social Sciences and Humanities Electives Select 6 courses for a minimum of 18 credits as follows: 1 18	or MATH 1941	Honors Calculus I	
PHYS 1021 Introduction to General Physics I PHYS 1061 Elementary Classical Physics I or PHYS 1961 Honors Elementary Classical Physics I PHYS 2021 General Physics I or PHYS 2921 Honors General Physics I  Anatomy and Physiology Select one of the following: 3-4 KINS 1221 Principles of Anatomy and Physiology I KINS 1223 Human Anatomy and Physiology I Select one of the following: 3-4 KINS 1222 Principles of Anatomy and Physiology II KINS 1224 Principles of Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology II Social Sciences and Humanities Electives Select 6 courses for a minimum of 18 credits as follows: 1 18	Physics		
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or PHYS 2921 Honors General Physics I  Anatomy and Physiology  Select one of the following: 3-4  KINS 1221 Principles of Anatomy and Physiology I  KINS 1223 Human Anatomy and Physiology I  Select one of the following: 3-4  KINS 1222 Principles of Anatomy and Physiology II  KINS 1224 Human Anatomy and Physiology II  KINS 1224 Human Anatomy and Physiology II  Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1 18	or PHYS 1961	Honors Elementary Classical Physics I	
Anatomy and Physiology  Select one of the following: 3-4  KINS 1221 Principles of Anatomy and Physiology I  KINS 1223 Human Anatomy and Physiology I  Select one of the following: 3-4  KINS 1222 Principles of Anatomy and Physiology II  KINS 1224 Human Anatomy and Physiology II  KINS 1224 Human Anatomy and Physiology II  Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1 18	PHYS 2021	General Physics I	
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KINS 1222 Principles of Anatomy and Physiology II KINS 1224 Human Anatomy and Physiology II  Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1 18	KINS 1223	Human Anatomy and Physiology I	
KINS 1224 Human Anatomy and Physiology II  Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1  18	Select one of the following:		3-4
Social Sciences and Humanities Electives  Select 6 courses for a minimum of 18 credits as follows: 1  18	KINS 1222	Principles of Anatomy and Physiology II	
Select 6 courses for a minimum of 18 credits as follows: 1	KINS 1224	Human Anatomy and Physiology II	
Social Sciences	Select 6 courses for a minimum	of 18 credits as follows: 1	18
	Social Sciences		

Coloot at locat 2	es (6 aradita minimum) france et le est	t tue different departments
	es (6 credits minimum) from at least	t two different departments:
Anthropology		
Criminal Justice		
Geography		
History		
Political Science		
Psychology		
Religion		
Sociology		
Humanities		
Select at least 2 cours	es (6 credits minimum) from at least	t two different departments:
Architecture		
Classics		
Philosophy		
Communication/Pu	blic Speaking	
Fine Arts		
Intellectual Heritage	e	
Languages		
Literature		
Philosophy		
Total Credit Hours		6
Code	Title	Cı
		He
(F) - Fall only course		
(S) - Spring only cours	se	

It is recommended that students select courses that will satisfy General Education requirements. Please see your academic advisor for assistance with course selections.

# **Suggested Academic Plan**

# Bachelor of Science in Pharmaceutical Sciences with Concentration in Pre-Pharmacy Suggested Plan for New Students Starting in the 2025-2026 Academic Year

#### Years 1 and 2:

Year 1		
Fall		<b>Credit Hours</b>
Select one of the following:		4
CHEM 1031 & CHEM 1033	General Chemistry I and General Chemistry Laboratory I	
CHEM 1951 & CHEM 1953	Honors General Chemical Science I and Honors Chemical Science Laboratory I (F)	
Select one of the following:		4
MATH 1031	Differential and Integral Calculus	
MATH 1041 or MATH 1941	Calculus I or Honors Calculus I	
ENG 0802 or ENG 0812 or ENG 0902	Analytical Reading and Writing [GW] or Analytical Reading and Writing: ESL [GW] or Honors Analytical Reading and Writing [GW]	4
Social Sciences Elective <sup>1</sup>		3
	Credit Hours	15
Spring		
BIOL 1111 or BIOL 1911	Introduction to Organismal Biology or Honors Introduction to Organismal Biology	4

Select one of the following:		4
CHEM 1032 & CHEM 1034	General Chemistry II and General Chemistry Laboratory II	
CHEM 1952	Honors General Chemical Science II	
& CHEM 1954	and Honors Chemical Science Laboratory II (S)	
Social Sciences Elective <sup>1</sup>	and honore enomined estation (e)	3
Humanities Elective <sup>1</sup>		3
	Credit Hours	14
Year 2		
Fall		
Select one of the following:		4
BIOL 1112	Introduction to Biomolecules, Cells and Genomes	
or BIOL 1912	or Honors Introduction to Biomolecules, Cells and Genomes	
BIOL 2112	Introduction to Cellular and Molecular Biology	
or BIOL 2912	or Honors Introduction to Cellular and Molecular Biology	
Select one of the following:		4
CHEM 2201 & CHEM 2203	Organic Chemistry I	
CHEM 2921	and Organic Chemistry Laboratory I Organic Chemistry for Honors I	
& CHEM 2923	and Organic Honors Laboratory I (F)	
Select one of the following:		3-4
KINS 1221	Principles of Anatomy and Physiology I	
KINS 1223	Human Anatomy and Physiology I	
Humanities Elective <sup>1</sup>		3
Social Sciences or Humaniti	ies Elective <sup>1</sup>	3
	Credit Hours	17-18
Spring		
Select one of the following:		4
CHEM 2202 & CHEM 2204	Organic Chemistry II and Organic Chemistry Laboratory II	
CHEM 2922 & CHEM 2924	Organic Chemistry for Honors II and Organic Honors Laboratory II (S)	
Select one of the following:		4
PHYS 1021	Introduction to General Physics I	
PHYS 1061 or PHYS 1961	Elementary Classical Physics I or Honors Elementary Classical Physics I	
PHYS 2021	General Physics I	
or PHYS 2921	or Honors General Physics I	
Select one of the following:		3-4
KINS 1222	Principles of Anatomy and Physiology II	
KINS 1224	Human Anatomy and Physiology II	
Social Sciences or Humaniti		3
	Credit Hours	14-15
	Total Credit Hours	60-62
Code	Title	Credit
Coue		Hours
(F) - Fall only course		Hours

<sup>1</sup> It is recommended that students select courses that will satisfy General Education requirements. Please see your academic advisor for assistance with course selections.