Bachelor of Science in Bioengineering - Pre-Health Concentration

Learn more about the Bachelor of Science in Bioengineering.

Goals, Objectives & Integration

A concentration in Pre-Health within the Bioengineering program provides students with the preparation and much of the coursework needed for a student to prepare to take national tests such as the MCAT and DCAT for entrance to graduate school in medicine, dentistry or in other health-related studies. The Pre-Health concentration contains similar courses as Cellular Engineering with the ability for students to pursue the specific coursework requirements for their desired post-baccalaureate program.

Summary of Requirements

University Requirements

All new students are required to complete the university's General Education (GenEd) Curriculum.

All Temple students must take a minimum of two writing intensive courses for a total of at least six credits. The writing intensive course credits are counted as part of the major; they are not General Education (GenEd) or elective credits. The writing intensive courses must be completed at Temple University and students may not transfer in credits to satisfy this requirement. The specific writing intensive courses required for this major are:

Code	Title	Credit Hours
ENGR 2196	Technical Communication	3
or ENGR 2996	Honors Technical Communication	
ENGR 4296	Senior Design Project II	3
or ENGR 4996	Honors Senior Design Project II	

Department and Major Requirements

Code	Title	Credit Hours
MATH 1041	Calculus I	4
or MATH 1941	Honors Calculus I	
MATH 1042	Calculus II	4
or MATH 1942	Honors Calculus II	
MATH 2043	Calculus III	4
or MATH 2943	Honors Calculus III	
Select one of the following:		3
MATH 2041	Differential Equations I	
or MATH 2941	Honors Differential Equations I	
MATH 3041	Differential Equations I	
or MATH 3941	Honors Differential Equations I	
BIOL 2112	Introduction to Cellular and Molecular Biology	4
or BIOL 2912	Honors Introduction to Cellular and Molecular Biology	
or BIOL 1112	Introduction to Biomolecules, Cells and Genomes	
CHEM 1031	General Chemistry I	3
or CHEM 1951	Honors General Chemical Science I	
CHEM 1033	General Chemistry Laboratory I	1
or CHEM 1953	Honors Chemical Science Laboratory I	
PHYS 2021	General Physics I	4
or PHYS 2921	Honors General Physics I	
or PHYS 1061	Elementary Classical Physics I	
or PHYS 1961	Honors Elementary Classical Physics I	
PHYS 2022	General Physics II	4

or PHYS 2922	Honors General Physics II	
or PHYS 1062	Elementary Classical Physics II	
or PHYS 1962	Honors Elementary Classical Physics II	
Required General Education Courses		
Select one of the following:		4
ENG 0802	Analytical Reading and Writing	
ENG 0812	Analytical Reading and Writing: ESL	
ENG 0902	Honors Literature/Reading/Writing	
IH 0851	Intellectual Heritage I: The Good Life	3
or IH 0951	Honors Intellectual Heritage I: The Good Life	
IH 0852	Intellectual Heritage II: The Common Good	3
or IH 0952	Honors Intellectual Heritage II: The Common Good	
GenEd 08xx or 09xx (Human Behavior)		3
GenEd 08xx or 09xx (Race and Diversity)		3
GenEd 08xx or 09xx (Global/World Society)		3
GenEd 08xx or 09xx (U.S. Society)		3
GenEd 08xx or 09xx (Arts)		3
Required Bioengineering & Engineering Courses (Common for all Pathways)		
BIOE 2001	Frontiers in Bioengineering	2
BIOE 2101	Engineering Principles of Physiological Systems	3
BIOE 3001	Research Design and Methods in Bioengineering	2
BIOE 3101	Bioelectrical Engineering Lab	3
BIOE 3102	Biomaterials Lab	3
BIOE 3201	Biomedical Instrumentation	2
BIOE 4101	Biomechanics Lab	3
BIOE 4311	The Entrepreneurial Bioengineer	3
ENGR 1101	Introduction to Engineering & Engineering Technology	3
or ENGR 1901	Honors Introduction to Engineering	
ENGR 1102	Introduction to Engineering Problem Solving	3
ENGR 2196	Technical Communication	3
or ENGR 2996	Honors Technical Communication	
ENGR 3571	Classical and Statistical Thermodynamics	3
ENGR 4169	Engineering Seminar	1
ENGR 4174	Senior Design Project I for Bioengineering	2
ENGR 4296	Senior Design Project II	3
or ENGR 4996	Honors Senior Design Project II	
Required Bioengineering Electives (minimum 9 credits)		
BIOE 2201	Modeling Fundamentals in Bioengineering	1.5
BIOE 2202	Programming Fundamentals in Bioengineering	1.5
BIOE 3303	Biotransport Phenomena	3
Select from the following list:		3
BIOE 2312	Mechanics for Bioengineering I	
BIOE 2401	Biodesign - Needs and Ideation	
BIOE 3302	Drug Delivery	
BIOE 3331	Principles of Macromolecular Science	
BIOE 3401	Biodesign - Testing and Validation	
BIOE 3511	Interactions of Biomaterials with Living Tissues	
BIOE 3725	Cell Biology for Engineers	
BIOE 4278	Cardiac Devices	
Any other approved bioengineering electives (note additional prerequisite courses may need to be taken)		
Required Technical Electives		
BIOL 1111	Introduction to Organismal Biology	4

or BIOL 1911	Honors Introduction to Organismal Biology	
CHEM 1032	General Chemistry II	3
or CHEM 1952	Honors General Chemical Science II	
CHEM 1034	General Chemistry Laboratory II	1
or CHEM 1954	Honors Chemical Science Laboratory II	
CHEM 2201	Organic Chemistry I	3
or CHEM 2921	Organic Chemistry for Honors I	
CHEM 2203	Organic Chemistry Laboratory I	1
or CHEM 2923	Organic Honors Laboratory I	
CHEM 2202	Organic Chemistry II	3
or CHEM 2922	Organic Chemistry for Honors II	
CHEM 2204	Organic Chemistry Laboratory II	1
or CHEM 2924	Organic Honors Laboratory II	
CHEM 3401	Applications of Biochemistry	3
Bioengineering Capstone Course		
Select one of the following:		3
BIOE 4333	Capstone Elective: Applied Biospectroscopy	
BIOE 4411	Capstone Elective: Biomaterials	
BIOE 4431	Capstone Elective: Neuroengineering	
BIOE 4461	Capstone Elective: Principles of Tissue Engineering	
BIOE 4501	Capstone Elective: Regenerative Engineering	
BIOE 4555	Capstone Elective - Biophotonics: Seeing is Believing	
Other Bioengineering Capstone courses (note additional prerequisite courses may need to be taken)		
Free Elective		2
Total Credit Hours		**128**

Suggested Academic Plan

Please note that this is a **suggested** academic plan. Depending on your situation, your academic plan may look different.

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Requirements for New Students starting in the 2022-2023 Academic Year

Year 1		
Fall		**Credit Hours**
MATH 1041 or 1941	Calculus I	4
CHEM 1031 or 1951	General Chemistry I	3
CHEM 1033 or 1953	General Chemistry Laboratory I	1
ENG 0802, 0812, or 0902	Analytical Reading and Writing [GW]	4
ENGR 1101 or 1901	Introduction to Engineering & Engineering Technology	3
	Term Credit Hours	**15**
Spring		
MATH 1042 or 1942	Calculus II	4
Select one of the following:		4
PHYS 2021 or 2921	General Physics I	
PHYS 1061 or 1961	Elementary Classical Physics I	
BIOE 2001	Frontiers in Bioengineering	2
CHEM 1032 or 1952	General Chemistry II	3
CHEM 1034 or 1954	General Chemistry Laboratory II	1
ENGR 1102	Introduction to Engineering Problem Solving	3
	Term Credit Hours	**17**
Year 2		
Fall		
MATH 2043 or 2943	Calculus III	4

Select one of the following:		4
PHYS 2022 or 2922	General Physics II	
PHYS 1062 or 1962	Elementary Classical Physics II	
CHEM 2201 or 2921	Organic Chemistry I	3
CHEM 2203 or 2923	Organic Chemistry Laboratory I	1
Select one of the following:		4
BIOL 2112 or 2912	Introduction to Cellular and Molecular Biology	
BIOL 1112	Introduction to Biomolecules, Cells and Genomes	
BIOE 3001	Research Design and Methods in Bioengineering	2
	Term Credit Hours	**18**
Spring		
BIOE 3201	Biomedical Instrumentation	2
BIOE 2101	Engineering Principles of Physiological Systems	3
BIOE 3102	Biomaterials Lab	3
CHEM 2202 or 2922	Organic Chemistry II	3
CHEM 2204 or 2924	Organic Chemistry Laboratory II	1
BIOE 2201	Modeling Fundamentals in Bioengineering (Proposed New Course: Modeling in BioE)	1.5
BIOE 2202	Programming Fundamentals in Bioengineering (Proposed New Course: Programming in BioE)	1.5
ENGR 3571	Classical and Statistical Thermodynamics	3
	Term Credit Hours	**18**
Year 3		
Fall		
BIOE 3101	Bioelectrical Engineering Lab	3
BIOL 1111 or 1911	Introduction to Organismal Biology	4
ENGR 2196 or 2996	Technical Communication [WI]	3
Select one of the following:		3
MATH 2041 or 2941	Differential Equations I	
MATH 3041 or 3941	Differential Equations I	
BIOE 3303	Biotransport Phenomena	3
	Term Credit Hours	**16**
Spring		
CHEM 3401	Applications of Biochemistry	3
ENGR 4169	Engineering Seminar	1
BIOE 4101	Biomechanics Lab	3
Free Elective		2
IH 0851 or 0951	Intellectual Heritage I: The Good Life [GY]	3
GenEd Breadth Course		3
	Term Credit Hours	**15**
Year 4		
Fall		
ENGR 4174	Senior Design Project I for Bioengineering	2
GenEd Breadth Course		3
Bioengineering Capstone - select one of the following:		3
BIOE 4333	Capstone Elective: Applied Biospectroscopy	
BIOE 4411	Capstone Elective: Biomaterials	
BIOE 4431	Capstone Elective: Neuroengineering	
BIOE 4461	Capstone Elective: Principles of Tissue Engineering	
BIOE 4501	Capstone Elective: Regenerative Engineering	
BIOE 4555	Capstone Elective - Biophotonics: Seeing is Believing	
BIOE 4311	The Entrepreneurial Bioengineer	3
IH 0852 or 0952	Intellectual Heritage II: The Common Good [GZ]	3
	Term Credit Hours	**14**

Spring		
ENGR 4296 or 4996	Senior Design Project II [WI]	3
BIOE Elective Course		3
GenEd Breadth Course		3
GenEd Breadth Course		3
GenEd Breadth Course		3
	Term Credit Hours	**15**
	Total Credit Hours:	**128**