

College of Science
Bachelor of Science in NANOSCIENCE
Major in NANOMEDICINE
For students entering under UG catalog 2022-2023

I. Pathways to General Education (47 credit hours)

All courses used for the Pathways to General Education must be on the University's approved list.

Pathway 1f – Foundational Discourse (6 credit hours)

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Pathway 1a – Advanced Discourse (3 credit hours)

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Pathway 2 – Critical Thinking in the Humanities (6 credit hours)

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Pathway 3 – Reasoning in the Social Sciences (6 credit hours)

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Pathway 4 – Reasoning in the Natural Sciences (8 credit hours)

PHYS 2205 General Physics*	3__	PHYS 2206 General Physics*	3__
PHYS 2215 General Physics Lab*	1__	PHYS 2216 General Physics Lab*	1__

Pathway 5f – Foundational Quantitative and Computational Thinking (6 credit hours)

MATH 1025 Elementary Calculus*	3__	MATH 1026 Elementary Calculus*	3__
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Pathway 5a – Advanced Quantitative and Computational Thinking (3 credit hours)

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Pathway 6a – Critique and Practice in the Arts (3 credit hours)

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Pathway 6d – Critique and Practice in Design (3 credit hours)

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Pathway 7 – Critical Analysis and Equity and Identity in the United States (3 credit hours)

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II. Nanoscience Degree Core Requirements (34 credit hours)

FALL#		SPRING#	
NANO 1015 Introduction to Nanoscience*	3__	NANO 1016 Introduction to Nanoscience*	3__
NANO 2114 Nanoscience Research Seminar*	1__	NANO 2024 Quantum Physics of Nanostructures*	4__
NANO 3015 Nanoscale Synthesis, Fabrication, and Characterization*	4__	NANO 3016 Nanoscale Synthesis, Fabrication, and Characterization*	4__
NANO 3114 Professional Dissemination of Nanoscience Research*	1__	NANO 3124 Nanoscience and the Environment*	3__
NANO 4324 Introduction to Nanomedicine*	3__	NANO 4994 Undergraduate Research*^	8__

III. Nanomedicine Major Requirements (26 credit hours)

FALL [#]		SPRING [#]	
BIOL 1105 Principles of Biology*	3__	BIOL 1106 Principles of Biology*	3__
BIOL 1115 Principles of Biology Laboratory*	1__	BIOL 1116 Principles of Biology Laboratory*	1__
CHEM 1035 General Chemistry*	3__	CHEM 1036 General Chemistry*	3__
CHEM 1045 General Chemistry Lab*	1__	CHEM 1046 General Chemistry Lab*	1__
CHEM 2535 Organic Chemistry	3__	CHEM 2536 Organic Chemistry	3__
CHEM 2545 Organic Chemistry Lab	1__	CHEM 2546 Organic Chemistry Lab	1__
		BIOL 2124 Cell and Molecular Biology for Engineers	2__

IV. Restricted Electives (9 credit hours):

Pick 3 of the following courses. At least 6 credit hours must be at the 3000 or 4000 level; at least 3 credit hours must be at the 4000 level.

BCHM 3114 Biochemistry for Biotechnology & the Life Sciences*	3__	BCHM 4116 General Biochemistry*	3__
BCHM/BIOL 4784 Applications in Molecular Life Science*	3__	BIOL 2004 Genetics*	3__
BIOL 2604 General Microbiology*	3__	BIOL 3134 Human Genetics* [∞]	3__
BIOL 3404 Introductory Animal Physiology* [∞]	3__	BIOL 3774 Molecular Biology* [∞]	3__
BIOL 4664 Virology* [∞]	3__	BIOL 4674 Pathogenic Bacteriology* [∞]	3__
BIOL 4704 Immunology* [∞]	3__	BIOL 4734 Inflammation Biology* [∞]	3__
BIOL 4874 Cancer Biology* [∞]	3__	BIOL 4884 Cell Biology* [∞]	3__
BMSP 2135 Human Anatomy & Physiology*	3__	BMSP 2136 Human Anatomy & Physiology*	3__
CHEM 4514 Green Chemistry*	3__	CHEM/SBIO 4424 Polysaccharide Chemistry*	3__
CHEM 4444 Bioinorganic Chemistry*	3__	CHEM 4554 Drug Chemistry*	3__
FST 4504 Food Chemistry*	3__	NEUR 2025 Introduction to Neuroscience*	3__
NEUR 2026 Introduction to Neuroscience*	3__	NEUR 2554 Experimental Neuroscience*	3__
NEUR 3084 Cognitive Neuroscience*	3__	NEUR 3144 Mechanisms of Learning and Memory*	3__
NEUR 3774 Neuroendocrinology*	3__	NEUR 3914 Neuroscience of Drug Addiction*	3__
NEUR 3844 Computational Neuroscience & Neural Engineering*	3__	NEUR 4034 Diseases of the Nervous System*	3__
NEUR 4314 Genetics in Neuroscience*	3__	NEUR 4514 Neuroimmunology*	3__
NEUR 4544 Synaptic Structure and Function*	3__	PHS 4064 Modeling Infectious Diseases*	3__
PSYC 2064 Introduction to Neuroscience of Behavior*	3__	SYSB 2024 Fundamentals of Systems Biology* [#]	3__
SYSB 2034 Mathematical Methods in Systems Biology* [#]	3__	SYSB 3035 Systems Biology of Genes & Proteins*	4__
SYSB 3036 Systems Biology of Genes & Proteins*	4__	SYSB 3115 Network Dynamics & Cell Physiology*	4__
SYSB 3116 Network Dynamics & Cell Physiology*	4__		

V. Free Electives (4 credit hours)

Prerequisites

Some courses on this checksheet have prerequisites. Students are required to double check course prerequisites and equivalents. Please see your advisor or consult the [Undergraduate Course Catalog](#) for more information.

Acceptable Substitutions

BCHM 3114: BCHM 4115 General Biochemistry

BIOL 2124: BIOL 2104 Cell & Molecular Biology OR BIOL 2134 Cell Function Differentiation OR
NEUR 3044 Cell Molecular Neuroscience

SYSB 3035: BIOL 4824 Bioinformatics Methods

CHEM 1035/1036: CHEM 1055/1056 General Chemistry for Majors

CHEM 1045/1046: CHEM 1065/1066 General Chemistry Lab for Majors

CHEM 2535/2536: CHEM 2565/2566 Principles of Organic Chemistry

CHEM 2545/2546: CHEM 2555/2556 Organic Synthesis & Techniques Lab

MATH 1025/1026: MATH 1225/1226 Calculus of a Single Variable

NANO 2024: PHYS 3324 Modern Physics OR NANO 2324 Quantum Mechanics for Nanomedicine

NANO 3016: NANO 4334 Advanced Nanomedicine AND NANO 4354 Advanced Nanomedicine Lab

PHYS 2205/2215: PHYS 2305 Foundations of Physics

PHYS 2206/2216: PHYS 2306 Foundations of Physics

BIOL 1105, BIOL 1115-1116, CHEM 1035-1036, CHEM 1045-1046, MATH 1025-1026, PHYS 2205-2206, PHYS 2215-2216:

ISC 1105-1106, ISC 1115-1116, ISC 2105-2106, ISC 2115-2116 Integrated Science I-II and Integrated Science Lab I-II

Foreign Language Requirement

Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.

Satisfactory Progress Towards Degree

Upon having attempted 72 credit hours, the student will have completed NANO 1015-1016, MATH 1025-1026, CHEM 1035-1036, CHEM 1045-1046, PHYS 2205-2206, PHYS 2215-2216, BIOL 1105, BIOL 1106, BIOL 1115, & BIOL 1116

Graduation Requirements

120 credit hours are required for graduation. These credits must include the courses required for the major (see above sections). To graduate, a student must have at least a 2.0 in-major GPA and overall GPA.

* **In Major GPA:** Courses marked with * will be used for computing the "in major" GPA.

Fall/Spring Course Offerings: Please consult with your advisor to ensure the courses are offered in the semester you intend to take them.

^ **Undergraduate Research:** All 8 credits are not taken in one semester. They are often split among different semesters.

∞ **BIOL 2124** is not an accepted prerequisite for BIOL courses that require BIOL 2134. Students wishing to take BIOL courses from the restricted electives list should take BIOL 2134. Please consult your advisor as to which course is right for you.