Physics - Undergraduate Programs

Academic Advising: 107 Life Science Building • 817.272.9685

Degree Programs

The Department of Physics offers five Bachelor of Science degree programs, a Bachelor of Arts degree program, and a Bachelor of Science in Physics/Master's in Materials Science and Engineering Fast Track Program.

The Bachelor of Science degree programs include one which prepares students for careers in science and technology, another for medical school preparation, and a third for students wanting to minor in an Engineering discipline. When combined with the required UTeach education courses, the Bachelor of Science program is also appropriate for students who are interested in becoming schoolteachers.* The Bachelor of Arts degree in Physics is intended for students who seek a broader education while retaining a firm foundation in Physics. The Bachelor of Science degree in Physics/Master's degree in Materials Science and Engineering Fast Track Program enables outstanding senior undergraduate students in Physics to satisfy degree requirements leading to a Bachelor's degree in Physics while simultaneously pursuing a Master's degree in Materials Science and Engineering.

Students considering a Physics major should schedule an appointment with the undergraduate advisor in Physics to discuss their degree and career options. Physics majors are encouraged to participate in research projects under faculty guidance for course credit or financial reward. In this way, undergraduate students have the choice of gaining hands-on experience from a variety of research disciplines, including astrophysics, biophysics, computational physics, high energy physics, medical physics, optics, space physics, and theoretical and experimental condensed matter physics.

The faculty of the Physics Department encourages qualified students to participate in the university's Honors College. Scholarships may be offered every year to new students majoring in Physics.

* Students desiring certification for teaching at the secondary level must fulfill specific requirements for the appropriate Physics B.S. Teacher Certification degree.

Second Major in Physics

Students who satisfy the requirements for any other baccalaureate degree qualify to have Physics named as a second major upon completion of the following courses:

PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		17
Total Hours		**37**

Teacher Certification

Students who are interested in earning a Bachelor of Science degree in Physics with Secondary Teacher Certification should refer to the Bachelor of Science in Physics with Physical Science Teacher Certification and the Bachelor of Science in Physics with Physics/Mathematics Teacher Certification degree plans for requirements. Teacher certification is offered through the UTeach program.

Requirements for a Bachelor of Science in Physics

This program provides students with a rigorous training in Physics, which is designed to prepare for a career in science, technology, and/or engineering research.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/).

PRE-PROFESSIONAL COURSES		
RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3

POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4
Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 2321	WORLD HISTORY TO 1400	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		
DATA 3401	PYTHON FOR DATA SCIENCE 1	4
or higher-numbered CSE course		
PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by Physics undergraduate advisor and/or Chair of the Department of Physics		
CHEM 1441	GENERAL CHEMISTRY I	4
CHEM 1442	GENERAL CHEMISTRY II	4
courses for majors offered in the departments of Biology and/or Earth and Environmental Sciences		6
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
or MATH 3318	DIFFERENTIAL EQUATIONS	
MATH 4000-level elective		3
Students may obtain a Mathematics minor by consulting with the undergraduate advisor for the Department of Mathematics to discuss additional requirements.		
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1
PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
PHYS 4319	ADVANCED MECHANICS	3
PHYS 4324	ADVANCED ELECTRICITY AND MAGNETISM	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		14
General Electives		**10**
36 hours of coursework must be advanced (3000/4000-level) to earn degree.		
Total Hours		**123**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor, particularly since many courses in Physics are not offered every semester. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS I, in the first semester.

First Year

First Semester	Hours	Second Semester	Hours
PHYS 1443	4	PHYS 1444	4
MATH 1426	4	ENGL 1302	3
ENGL 1301	3	MATH 2425	4
HIST 1301	3	HIST 1302	3
	14		**14**

Second Year

First Semester	Hours	Second Semester	Hours
PHYS 3313	3	PHYS 2311	3
MATH 2326	3	PHYS 3183	1
MATH 3319 or 3318	3	BIOL or GEOL course for majors	3
Creative Arts*	3	Social/Behavioral Science*	3
CHEM 1441	4	CHEM 1442	4
	16		**14**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3321	3	PHYS 4324	3
approved PHYS elective	4	approved PHYS elective	4
Data Science Course (DATA 3401 or CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	4	MATH 4000-level elective	3
POLS 2311	3	POLS 2312	3
General Elective	3	Language, Philosophy and Culture*	3
	17		**16**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	PHYS 4319	3
approved PHYS course	3	approved PHYS elective	3
BIOL or GEOL course for majors	3	Foundational Component Area*	3
General Elective	3	General Electives	4
	15		**14**

Total Hours: 120

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

Requirements for a Bachelor of Science in Physics with Engineering Emphasis

This program allows students to augment a rigorous training in Physics with the choice of a minor in a suitable engineering discipline, thus combining a theoretical understanding of the basic physical theories with a practical, more detailed understanding given in the College of Engineering. Such a combination would be a bonus for employment in the engineering-type professions often chosen by Physics majors.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/).

PRE-PROFESSIONAL COURSES

RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3
POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4

Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		
DATA 3401	PYTHON FOR DATA SCIENCE 1	4
or higher-numbered CSE course		
PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by Physics undergraduate advisor and/or Chair of the Department of Physics		
CHEM 1441	GENERAL CHEMISTRY I	4
course for majors in the departments of Biology, Chemistry and Biochemistry, or Earth and Environmental Sciences		4
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
or MATH 3318	DIFFERENTIAL EQUATIONS	
ENGINEERING MINOR: 18 or more hours as required by the appropriate Engineering department		18
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1
PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
PHYS 4324	ADVANCED ELECTRICITY AND MAGNETISM	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		12
General Electives		**6**
36 hours of coursework must be advanced (3000/4000-level) to earn degree.		
Total Hours		**120**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor as well as the undergraduate advisor in the appropriate Engineering department. Many courses in Physics are not offered every semester, and Engineering coursework and sequences are determined by individual departments in the College of Engineering. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS I, in the first semester.

First Year			
First Semester	**Hours**	**Second Semester**	**Hours**
PHYS 1443	4	PHYS 1444	4
MATH 1426	4	ENGL 1302	3
ENGL 1301	3	MATH 2425	4
HIST 1301	3	HIST 1302	3
	14		**14**
Second Year			
First Semester	**Hours**	**Second Semester**	**Hours**
PHYS 3313	3	PHYS 2311	3
MATH 2326	3	PHYS 3183	1
MATH 3319 or 3318	3	Engineering minor course**	3

Engineering minor course**	3	BIOL, CHEM, or GEOL course for majors	4
CHEM 1441	4	Creative Arts*	3
	16		**14**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3321	3	PHYS 4324	3
approved PHYS elective	4	approved PHYS elective	4
Engineering minor course**	3	Engineering minor course**	3
Data Science Course (DATA 3401 or CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	3-4	POLS 2312	3
POLS 2311	3	Social/Behavioral Science*	3
	16-17		**16**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	approved PHYS elective	4
Engineering minor course**	3	Engineering minor course**	3
Language, Philosophy and Culture*	3	Foundational Component Area*	3
General Elective	3	General Elective(s)	3-4
	15		**14-15**

Total Hours: 119-121

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual number of courses/hours and course sequence determined by appropriate Engineering department.

Requirements for a Bachelor of Science in Physics with Medical School Preparation

This program offers the broad background in fundamental science and strong problem-solving ability of a Physics degree as well as specific Biology and Chemistry medical school requirements. The combination of skills developed in this program is designed to provide the intellectual foundation necessary for excellence in research and the practice of medicine.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/).

PRE-PROFESSIONAL COURSES		
RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3
POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4
Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		3
DATA 3401	PYTHON FOR DATA SCIENCE 1	4

or higher-numbered CSE course		
PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by Physics undergraduate advisor and/or Chair of the Department of Physics		
CHEM 1441	GENERAL CHEMISTRY I	4
CHEM 1442	GENERAL CHEMISTRY II	4
CHEM 2321	ORGANIC CHEMISTRY I	3
CHEM 2181	ORGANIC CHEMISTRY I LABORATORY	1
CHEM 2322	ORGANIC CHEMISTRY II	3
CHEM 2182	ORGANIC CHEMISTRY II LABORATORY	1
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
or MATH 3318	DIFFERENTIAL EQUATIONS	
BIOLOGY MINOR		
BIOL 1441	BIOLOGY I FOR SCIENCE MAJORS: CELL AND MOLECULAR BIOLOGY	4
BIOL 1442	BIOLOGY II FOR SCIENCE MAJORS: ECOLOGY AND EVOLUTION	4
BIOL electives to give the total of 18 hours, 6 hours of which must be advanced (3000/4000-level)		10
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1
PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
or PHYS 4319	ADVANCED MECHANICS	
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		11
General Electives		**3**
36 hours of coursework must be advanced (3000/4000-level) to earn degree.		
Total Hours		**124**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

TYPICAL COURSE SEQUENCE

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor, particularly since many courses in Physics are not offered every semester. Consultation with the Health Professions advisor is also encouraged. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS I, in the first semester.

First Year			
First Semester	**Hours**	**Second Semester**	**Hours**
PHYS 1443	4	PHYS 1444	4
MATH 1426	4	MATH 2425	4
CHEM 1441	4	CHEM 1442	4
ENGL 1301	3	ENGL 1302	3
	15		**15**
Second Year			
First Semester	**Hours**	**Second Semester**	**Hours**
MATH 2326	3	PHYS 2311	3
MATH 3319 or 3318	3	BIOL 1441	4
CHEM 2321	3	CHEM 2322	3
CHEM 2181	1	CHEM 2182	1
HIST 1301	3	HIST 1302	3
	13		**14**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3313	3	approved PHYS elective	4
PHYS 3183	1	approved PHYS elective	3
PHYS 3321	3	BIOL minor course**	3
BIOL 1442	4	Data Science Course (DATA 3401 or CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	3-4
BIOL minor course**	3	Social/Behavioral Science*	3
	14		**16-17**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	approved PHYS elective	4
BIOL minor course**	4	POLS 2312	3
POLS 2311	3	Creative Arts*	3
Language, Philosophy and Culture*	3	Foundational Component Area*	3
		General Elective	2-3
	16		**16-17**

Total Hours: 119-121

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Coursework for Biology minor should be chosen in consultation with a Biology undergraduate advisor.

Requirements for a Bachelor of Arts in Physics

This program is intended for students who seek a broader education while retaining a firm foundation in Physics.

The University Core Curriculum consists of 42 credit hours from University Core Curriculum (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/).

PRE-PROFESSIONAL COURSES		
RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3
POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4
Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		3
CSE 1311	INTRODUCTION TO PROGRAMMING FOR ENGINEERS	3
or higher-numbered CSE course		

PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by Physics undergraduate advisor and/or Chair of the Department of Physics		
courses for majors in the departments of Biology, Chemistry and Biochemistry, and/or Earth and Environmental Sciences		8
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
or MATH 3318	DIFFERENTIAL EQUATIONS	
Modern and Classical Languages		4
MINOR: 18 or more hours as required by the appropriate department		18
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1
PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		11
General Electives		**7**
36 hours of coursework must be advanced (3000/4000-level) to earn degree.		
Total Hours		**123**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor, particularly since many courses in Physics are not offered every semester. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS ICALCULUS I, in the first semester.

First Year

First Semester	Hours	Second Semester	Hours
MATH 1426	4	PHYS 1443	4
BIOL, CHEM, or GEOL course for majors	4	MATH 2425	4
ENGL 1301	3	ENGL 1302	3
HIST 1301	3	HIST 1302	3
	14		**14**

Second Year

First Semester	Hours	Second Semester	Hours
PHYS 1444	4	PHYS 2311	3
MATH 2326	3	PHYS 3313	3
MATH 3319 or 3318	3	PHYS 3183	1
minor course**	3	BIOL, CHEM, or GEOL course for majors	4
Creative Arts*	3	minor course**	3
	16		**14**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3321	3	approved PHYS elective	4
approved PHYS elective	4	minor course**	3
minor course**	3	Computer Science course (CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	3
Modern/Classical Language	4	POLS 2312	3
POLS 2311	3	Social/Behavioral Science*	3
	17		**16**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	approved PHYS elective	3
minor course**	3	minor course**	3
Language, Philosophy and Culture*	3	Foundation Component Area*	3
General Elective	3	General Elective(s)	4
	15		**14**

Total Hours: 120

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual number of courses/hours and course sequence determined by appropriate department.

PRE-PROFESSIONAL COURSES

RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3
POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4
Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		3
CSE 1311	INTRODUCTION TO PROGRAMMING FOR ENGINEERS	3
or higher-numbered CSE course		
PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by UTeach advisor and/or Chair of the Department of Physics		
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
CHEMISTRY MINOR		
CHEM 1441	GENERAL CHEMISTRY I	4
CHEM 1442	GENERAL CHEMISTRY II	4
CHEM 2335	QUANTITATIVE CHEMISTRY	3
CHEM 2285	QUANTITATIVE CHEMISTRY LABORATORY	2
CHEM 3315	INTRODUCTION TO BIOPHYSICAL CHEMISTRY	3
CHEM 3321	PHYSICAL CHEMISTRY I	3
CHEM 3181	PHYSICAL CHEMISTRY I LABORATORY	1
TEACHER CERTIFICATION REQUIREMENTS (UTEACH)		
SCIE 1201	STEP 1: INQUIRY APPROACHES TO TEACHING	2
SCIE 1202	STEP 2: INQUIRY-BASED LESSON DESIGN	2
SCIE 4107	CAPSTONE TEACHING EXPERIENCE SEMINAR	1

SCIE 4607	CAPSTONE TEACHING EXPERIENCE FOR STEM SECONDARY GRADES	6
EDUC 4331	KNOWING AND LEARNING IN MATH AND SCIENCE	3
EDUC 4332	CLASSROOM INTERACTIONS	3
EDUC 4333	MULTIPLE TEACHING PRACTICES IN MATH AND SCIENCE	3
PHIL 2314	PERSPECTIVES ON SCIENCE AND MATHEMATICS	3
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1
PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
PHYS 4319	ADVANCED MECHANICS	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS 4391	SPECIAL TOPICS (Research Methods)	3
PHYS electives approved by UTeach advisor and/or Chair of the Department of Physics		6
36 hours of coursework must be advanced (3000/4000-level) to earn degree.		
Total Hours		**130**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor, particularly since many courses in Physics are not offered every semester. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS ICALCULUS I, in the first semester.

First Year

First Semester	Hours	Second Semester	Hours
MATH 1426	4	PHYS 1443	4
CHEM 1441	4	MATH 2425	4
ENGL 1301	3	ENGL 1302	3
HIST 1301	3	HIST 1302	3
SCIE 1201	2	SCIE 1202	2
	16		**16**

Second Year

First Semester	Hours	Second Semester	Hours
PHYS 1444	4	PHYS 2311	3
MATH 2326	3	PHYS 3313	3
MATH 3319	3	PHYS 3183	1
CHEM 1442	4	CHEM 2335	3
EDUC 4331	3	CHEM 2285	2
		EDUC 4332	3
	17		**15**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3321	3	PHYS 4391 (Research Methods)	3
CHEM 3315	3	approved PHYS elective	3
Computer Science course (CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	3	POLS 2312	3
POLS 2311	3	Creative Arts*	3
PHIL 2314	3	Social/Behavioral Science*	3
	15		**15**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	PHYS 4319	3
approved PHYS elective	3	Language, Philosophy and Culture*	3

CHEM 3321	3	Foundational Component Area*	3
CHEM 3181	1	SCIE 4107	1
EDUC 4333	3	SCIE 4607	6
	16		**17**

Total Hours: 127

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

PRE-PROFESSIONAL COURSES		
RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3
POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4
Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		3
CSE 1311	INTRODUCTION TO PROGRAMMING FOR ENGINEERS	3
or higher-numbered CSE course		
PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by UTeach advisor and/or Chair of the Department of Physics		
CHEM 1441	GENERAL CHEMISTRY I	4
CHEM 1442	GENERAL CHEMISTRY II	4
MATHEMATICS MINOR		
MATH 2326	CALCULUS III	3
MATH 2330	FUNCTIONS AND MODELING	3
MATH 3300	INTRODUCTION TO PROOFS	3
MATH 3301	FOUNDATIONS OF GEOMETRY	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
MATH 3321	ABSTRACT ALGEBRA I	3
TEACHER CERTIFICATION REQUIREMENTS (UTEACH)		
SCIE 1201	STEP 1: INQUIRY APPROACHES TO TEACHING	2
SCIE 1202	STEP 2: INQUIRY-BASED LESSON DESIGN	2
SCIE 4107	CAPSTONE TEACHING EXPERIENCE SEMINAR	1
SCIE 4607	CAPSTONE TEACHING EXPERIENCE FOR STEM SECONDARY GRADES	6
EDUC 4331	KNOWING AND LEARNING IN MATH AND SCIENCE	3
EDUC 4332	CLASSROOM INTERACTIONS	3
EDUC 4333	MULTIPLE TEACHING PRACTICES IN MATH AND SCIENCE	3

PHIL 2314	PERSPECTIVES ON SCIENCE AND MATHEMATICS	3
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1
PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
PHYS 4319	ADVANCED MECHANICS	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS 4391	SPECIAL TOPICS (Research Methods)	3
PHYS electives approved by UTeach advisor and/or Chair of the Department of Physics		6
36 hours of coursework must be advanced (3000/4000-level) to earn degree.		
Total Hours		**130**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor, particularly since many courses in Physics are not offered every semester. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS ICALCULUS I, in the first semester.

First Year

First Semester	Hours	Second Semester	Hours
MATH 1426	4	PHYS 1443	4
CHEM 1441	4	MATH 2425	4
ENGL 1301	3	ENGL 1302	3
HIST 1301	3	HIST 1302	3
SCIE 1201	2	SCIE 1202	2
	16		**16**

Second Year

First Semester	Hours	Second Semester	Hours
PHYS 1444	4	PHYS 2311	3
MATH 2326	3	PHYS 3313	3
MATH 3319	3	PHYS 3183	1
CHEM 1442	4	MATH 3300	3
EDUC 4331	3	MATH 3301	3
		EDUC 4332	3
	17		**16**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3321	3	PHYS 4391 (Research Methods)	3
approved PHYS elective	3	approved PHYS elective	3
MATH 2330	3	POLS 2311	3
Computer Science course (CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	3	Creative Arts*	3
PHIL 2314	3	Social/Behavioral Science*	3
	15		**15**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	PHYS 4319	3
MATH 3321	3	Language, Philosophy and Culture*	3
POLS 2312	3	Foundational Component Area*	3
EDUC 4333	3	SCIE 4107	1

	SCIE 4607	6
	15	**17**

Total Hours: 127

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

FOUNDATION COURSES – Required for Admission into the Fast Track Program

MSE 3300	INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3

PRE-PROFESSIONAL COURSES

RECOMMENDED CORE REQUIREMENTS		
ENGL 1301	RHETORIC AND COMPOSITION I	3
ENGL 1302	RHETORIC AND COMPOSITION II	3
Creative Arts *		3
POLS 2311	GOVERNMENT OF THE UNITED STATES	3
POLS 2312	STATE AND LOCAL GOVERNMENT	3
Language, Philosophy and Culture *		3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
MATH 1426	CALCULUS I	4
MATH 2425	CALCULUS II	4
Social/Behavioral Science *		3
HIST 1301	HISTORY OF THE UNITED STATES TO 1865	3
HIST 1302	HISTORY OF THE UNITED STATES, 1865 TO PRESENT	3
Foundational Component Area *		3
PROGRAM REQUIREMENTS		
Communication Competence - satisfied by PHYS 4117		
Computer Use Competence - satisfied by Computer Science requirement for major		
PROFESSIONAL COURSES		
Select one of the following for Computer Science requirement:		3
CSE 1311	INTRODUCTION TO PROGRAMMING FOR ENGINEERS	3
or higher-numbered CSE course		
PHYS 2321	COMPUTATIONAL PHYSICS	
MATH 3345	NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS	
or other suitable course approved by Physics undergraduate advisor and/or Chair of the Department of Physics		
CHEM 1441	GENERAL CHEMISTRY I	4
CHEM 1442	GENERAL CHEMISTRY II	4
course for majors offered in the departments of Biology, Chemistry and Biochemistry, or Earth and Environmental Sciences		4
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
or MATH 3318	DIFFERENTIAL EQUATIONS	
MSE 3300	INTRODUCTION TO MATERIALS SCIENCE AND ENGINEERING	3
MSE graduate or advanced (3000/4000-level) courses approved by MSE graduate advisor		9
MAJOR		
PHYS 2311	MATHEMATICAL METHODS OF PHYSICS	3
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS 3183	MODERN PHYSICS LABORATORY	1
PHYS 3321	INTERMEDIATE ELECTRICITY AND MAGNETISM	3
PHYS 3445	OPTICS	4
PHYS 4117	INDIVIDUAL LEARNING BY SEMINAR	1

PHYS 4315	THERMODYNAMICS AND STATISTICAL MECHANICS	3
PHYS 4326	INTRODUCTION TO QUANTUM MECHANICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		12
General Electives		**8**
36 hours of coursework must be advanced (3000/4000-level) to earn degree; up to 9 hours can be graduate-level (only for approved MSE coursework).		
Total Hours		**123**

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

Details of a personal course sequence should be made with the guidance of the Physics undergraduate advisor, particularly since many courses in Physics are not offered every semester. For all entering freshmen, it is important to begin the mathematics sequence, starting with MATH 1426 CALCULUS ICALCULUS I, in the first semester.

First Year

First Semester	Hours	Second Semester	Hours
MATH 1426	4	PHYS 1443	4
CHEM 1441	4	MATH 2425	4
ENGL 1301	3	CHEM 1442	4
HIST 1301	3	ENGL 1302	3
	14		**15**

Second Year

First Semester	Hours	Second Semester	Hours
PHYS 1444	4	PHYS 2311	3
MATH 2326	3	PHYS 3313	3
MATH 3319 or 3318	3	PHYS 3183	1
MSE 3300	3	BIOL, CHEM, or GEOL course for majors	4
Creative Arts*	3	Language, Philosophy and Culture*	3
	16		**14**

Third Year

First Semester	Hours	Second Semester	Hours
PHYS 3321	3	approved PHYS elective	4
PHYS 3445	4	approved PHYS elective	4
Computer Science course (CSE 1311 or higher-numbered CSE course, PHYS 2321, or MATH 3345)	3	HIST 1302	3
POLS 2311	3	POLS 2312	3
Social/Behavioral Science*	3		
	16		**14**

Fourth Year

First Semester	Hours	Second Semester	Hours
PHYS 4315	3	PHYS 4117	1
PHYS 4326	3	approved PHYS elective	4
approved MSE course**	3	approved MSE course**	3
approved MSE course**	3	Foundational Component Area*	3
General Elective(s)	4	General Elective(s)	4
	16		**15**

Total Hours: 120

* See General Core Requirements (http://catalog.uta.edu/archives/2023-2024/academicregulations/degreerequirements/generalcorerequirements/) for approved courses.

** Actual courses and course sequence determined by Materials Science and Engineering Department.

Minor in Physics

A minimum total of 18 credit hours (including a minimum of 6 hours at the 3000/4000 level) are required. Transfer students must complete a minimum of 9 hours at UTA, 6 of which must be 3000/4000-level. A 2.0 GPA is required for coursework in the minor.

REQUIRED COURSES		
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	3
PHYS electives approved by Physics undergraduate advisor and/or Chair of the Department of Physics		7
Total Hours		**18**

Minor in Astronomy for Non-Physics Majors

A minimum total of 18 credit hours (including a minimum of 6 hours at the 3000/4000 level) are required. Transfer students must complete a minimum of 9 hours at UTA, 6 of which must be 3000/4000-level. A 2.0 GPA is required for coursework in the minor.

REQUIRED COURSES		
PHYS 1441	GENERAL COLLEGE PHYSICS I	4
PHYS 1442	GENERAL COLLEGE PHYSICS II	4
PHYS 2315	INTRODUCTORY ASTROPHYSICS	3
PHYS 3315	ASTROPHYSICS AND COSMOLOGY	3
PHYS 3316	ASTROBIOLOGY I	3
Elective Courses - choose from the following (approval from the Physics undergraduate advisor is required):		1
Special Problems (PHYS 4181, PHYS 4281 - with Astronomy research faculty)		
Special Topics (PHYS 4191, PHYS 4291, PHYS 4391 - when a suitable topic is offered)		
Total Hours		**18**

Minor in Astrophysics for Non-Physics Majors

A minimum total of 18 credit hours (including a minimum of 6 hours at the 3000/4000 level) are required. Transfer students must complete a minimum of 9 hours at UTA, 6 of which must be 3000/4000-level. A 2.0 GPA is required for coursework in the minor.

REQUIRED COURSES		
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
PHYS 2315	INTRODUCTORY ASTROPHYSICS	3
PHYS 3315	ASTROPHYSICS AND COSMOLOGY	3
Elective Courses - choose from the following:		4
PHYS 3313	INTRODUCTION TO MODERN PHYSICS	
PHYS 3316	ASTROBIOLOGY I	
PHYS 3445	OPTICS	
PHYS 3446	NUCLEAR AND PARTICLE PHYSICS	
Special Problems (PHYS 4181, PHYS 4281 - with Astronomy research faculty)		
Special Topics (PHYS 4191, PHYS 4291, PHYS 4391 - when a suitable topic is offered)		
Approval from the Physics undergraduate advisor is required for Special Problems and Special Topics courses.		
Total Hours		**18**