

Northeast Texas Community College &  
Texas A&M University – Texarkana  
2019-2020 Guided Pathways

Associate of Science in General Studies to  
Bachelor of Science in Chemistry, 7-12 Chemistry Certification

NTCC		A&M-TEXARKANA	
COURSES	HOURS	COURSES	HOURS
ENGL 1301	3	CHEM 340	4
SPCH 1315 (or) SPCH 1321	3	CHEM 410	4
MATH 2413	4	CHEM 351	4
BIOL 1406	4	CHEM 321	4
BIOL 1407	4	CHEM 497	3
HIST 2321*	3	CHEM 440	4
ARTS 1301*	3	RDG 343	3
HIST 1301	3	ED 311	3
HIST 1302	3	ED 321	3
GOVT 2305	3	CHEM 405	3
GOVT 2306	3	CHEM 479	3
PSYC 2301*	3	UD Elective (To Satisfy Degree Requirements)	4
ENGL 1302	3	BLOCK I	
CHEM 1411 (CAO B)	4	ED 331	3
SPAN 1411*	4	ED 495	3
PHED*	2	BLOCK II	
CHEM 1412 (Elective)	4	ED 496	3
CHEM 2423 (Elective)	4	SPED 418	3
CHEM 2425 (Elective)	4		
OTHER REQUIREMENTS:			
PHYS 2425	4		
PHYS 2426	4		
2.8 Minimum GPA			
TOTAL	72	TOTAL	126

\*Other Courses may Apply. See NTCC Degree Plan for Options

54 Upper Division (UD) Hours Required for the BS Degree

30 Hours of Residency Required

Travel to Main Campus in Texarkana Required to Complete Degree

UD= Upper Division

LD= Lower Division

Effective September 1, 2019 – August 31, 2024.

This unofficial degree plan is for informational purposes only.  
Please contact [Jennifer.perez@tamut.edu](mailto:Jennifer.perez@tamut.edu) for questions.

## TEACHER PREPARATION PROGRAM ADMISSION REQUIREMENTS

Apply 3rd Year, 1st Semester

1. Application to Teacher Prep Program via TK20 in September or February
2. GPA requirement of 2.8 cumulative
3. Completion of [ED 311](#), [ED 321](#) and [SPED 410](#) with grade C or above
4. Completion of 12 hours in Content Area with no grade below C

### COURSE DESCRIPTIONS

**CHEM 1311. General Chemistry I. 3 Hours.** This course covers the fundamental principles of chemistry. This course is the first of two general chemistry courses offered sequentially for majors in biological, health, and physical sciences. Topics include measurements, fundamental properties of matter, states of matter, chemical reactions, chemical stoichiometry, periodicity of elemental properties, atomic structure, chemical bonding, molecular structure, solutions, properties of gases, and an introduction to thermodynamics and descriptive chemistry. Prerequisite: [MATH 1314](#) or [MATH 2412](#). Corequisite: [CHEM 1111](#).

**CHEM 1111. General Chemistry I (Lab). 1 Hour.** This course introduces students to basic laboratory experiments supporting theoretical principles presented in [CHEM 1311](#). The course introduces the scientific method, experimental design, data collection and analysis, and preparation of laboratory reports. Corequisite: [CHEM 1311](#).

**CHEM 1312. General Chemistry II. 3 Hours.** This course is the second course of the general chemistry sequence. Topics include chemical equilibrium, phase diagrams and spectrometry, acid-base concepts, thermodynamics, kinetics, electrochemistry, nuclear chemistry, and an introduction to organic chemistry and descriptive organic chemistry. Prerequisite: [CHEM 1111](#) and [CHEM 1311](#). Corequisite: [CHEM 1112](#).

**CHEM 1112. General Chemistry II (Lab). 1 Hour.** This course introduces students to basic laboratory experiments supporting theoretical principles presented in [CHEM 1312](#). Students will be introduced to the use of the scientific method in experimental design, chemical instrumentation, data collection and analysis, and preparation of laboratory reports. Prerequisite: [CHEM 1111](#). Corequisite: [CHEM 1312](#).

**CHEM 2423. Organic Chemistry I. 4 Hours.** This course is the first of a comprehensive and somewhat rigorous survey of organic chemistry emphasizing nomenclature, structure, properties, synthesis, and reaction mechanisms of carbon compounds. Prerequisite: [CHEM 1312](#) with a grade of C or better.

Effective September 1, 2019 – August 31, 2024.

This unofficial degree plan is for informational purposes only.  
Please contact [Jennifer.perez@tamut.edu](mailto:Jennifer.perez@tamut.edu) for questions.

**CHEM 2425. Organic Chemistry II. 4 Hours.** This course is the second semester of Organic Chemistry sequence emphasizing the classes of aliphatic and aromatic compounds that contain oxygen and nitrogen. Prerequisite: [CHEM 2423](#).

**CHEM 340. Quantitative Chemical and Instrumental Analysis. 4 Hours.** This course covers fundamental theory and techniques in traditional chemical analysis. Topics include sampling and separation methods, measurements, statistics, equilibrium and pH studies, gravimetric and combustion analysis, electrochemical techniques, and introduction to instrumentation. Biology minors in Environmental Science require this course. Prerequisite: [CHEM 1312](#) with a grade of C or better.

**CHEM 410. Biochemistry I. 4 Hours.** Biochemistry I is the first semester of a one-year course. The first semester covers the structures and functions of amino acids, proteins, and simple and complex carbohydrates. This course also covers carbohydrate metabolism, including glycolysis, gluconeogenesis and signal cascades in carbohydrate metabolism. The course emphasizes understanding biochemistry from a biological point of view and on providing information on how biochemical events are regulated in living tissues. Prerequisite: [CHEM 2423](#) and [CHEM 2425](#) with a C or better in both courses.

**CHEM 351. Physical Chemistry I. 4 Hours.** This course is an introduction to quantum mechanics, solvable model problems, chemical kinetics, rigorous treatments of the first, second, and third laws of thermodynamics, as well as applications to gases (both ideal and real), liquids, solutions, and phase equilibria. Prerequisite: [MATH 2413](#), [PHYS 2325](#), and [PHYS 2326](#).

**CHEM 321. Inorganic Chemistry. 4 Hours.** This course focuses on descriptive inorganic chemistry. It covers bonding theories, redox chemistry, properties of main group and transition metals, ligand field theory, molecular magnetism, and electronic spectra in transition metal complexes. Prerequisites: [CHEM 1111](#), [CHEM 1112](#), [CHEM 1311](#), and [CHEM 1312](#).

**CHEM 497. Special Topics in Chemistry. 1-4 Hours.** This course provides instruction on special topics in an identified area of chemistry. Students may repeat the course for credit when topics vary. Prerequisite: Permission of instructor.

**BIOL 1306. Biology for Science Majors I. 3 Hours.** This course introduces the student to the nature of science and the application of science to contemporary issues. Content includes the chemistry of life, the cell, genetics, and mechanisms of evolution. Corequisite: [BIOL 1106](#).

**BIOL 1106. Biology for Science Majors I Lab. 1 Hour.** This course provides students with hands-on exploration in the biological sciences. Content includes the process of scientific inquiry, important concepts in biochemistry and genetics, and introduction to laboratory techniques. Corequisite: [BIOL 1306](#).

Effective September 1, 2019 – August 31, 2024.

This unofficial degree plan is for informational purposes only.  
Please contact [Jennifer.perez@tamut.edu](mailto:Jennifer.perez@tamut.edu) for questions.

**BIOL 1307. Biology for Science Majors II. 3 Hours.** This course introduces the student to the nature of science and the application of science to contemporary issues. Content includes plant form and function, animal form and function, and ecology. Prerequisite: [BIOL 1306](#). Corequisite: [BIOL 1107](#).

**BIOL 1107. Biology for Science Majors II Lab. 1 Hour.** This course provides students with hands-on exploration in the biological sciences. Content includes a survey of plants, animals, and microorganisms as well as studies of basic biological processes such as digestion, circulation, and nervous system function. Corequisite: [BIOL 1307](#).

**PHYS 2325. University Physics I. 3 Hours.** This course is a calculus based physics sequence for students in pre-professional programs, biology, geology, or architecture who do not expect to do additional work in engineering or physics. Topics include elementary vector algebra, mechanics, heat, thermodynamics and sound. Prerequisite or Corequisite: [MATH 2413](#). Corequisite: [PHYS 2125](#).

**PHYS 2125. University Physics I Lab. 1 Hour.** Physics lab covers elementary vector algebra, mechanics, heat, thermodynamics and sound. Prerequisite or Corequisite: [MATH 2413](#). Corequisite: [PHYS 2325](#).

**PHYS 2326. University Physics II. 3 Hours.** This course is a calculus-based physics sequence for students in computer science and engineering programs. This course covers electricity and magnetism, light, and modern physics. Prerequisite: [PHYS 2325](#) or PHYS 2425. Corequisite: [PHYS 2126](#).

**PHYS 2126. University Physics II Lab. 1 Hour.** This lab covers electricity and magnetism, light, and modern physics. Prerequisite or Corequisite: [MATH 2413](#). Corequisite: [PHYS 2326](#).

**ED 311. Growth and Development for EC to Grade 12 (EL). 3 Hours.** This is an introductory education course which presents theories of children's growth and development along with their relationship to learning and teaching. Cultural, emotional, physical, intellectual, and learning differences are studied for their impact on learning and educational opportunity. Students must be considered in their junior year and will be required to participate in 8 hours of field experience. This course integrates the principles of Experiential Learning and meets the criteria of field work.

**ED 321. Foundations of Education (EL). 3 Hours.** This introductory education course provides students knowledge and skills to 1) design instruction and assessment to promote student learning, 2) create a positive, productive classroom environment, 3) implement effective, responsive instruction and assessment, and 4) work effectively with ESL students in the regular education classroom. This course integrates the principles of Experiential Learning and meets the criteria for field work.

Effective September 1, 2019 – August 31, 2024.

This unofficial degree plan is for informational purposes only.  
Please contact [Jennifer.perez@tamut.edu](mailto:Jennifer.perez@tamut.edu) for questions.

**ED 331. Classroom and Behavior Management. 3 Hours.** This course presents best practices in classroom and behavior management including management of time, materials, and space. Additionally, the course examines strategies for managing individual and large-group student behaviors, transitions, lab activities, and other arrangements for classrooms in general and special education. Prerequisite: Admitted to the Teacher Preparation Program.

**ED 435. Secondary Content Pedagogy. 3 Hours.** This course provides students seeking certification in grades 4-8 and 7-12 with pedagogical best-practices. Students will learn lesson planning, assessment, and available resources for their specific content area. Methods for accessing and processing information through traditional as well as new technologies will be addressed. Prerequisite: Admission to the Teacher Preparation Program.

**ED 495. Block 1 - Co-Teaching Practicum for Certification Candidates (EL). 3 Hours.** This three semester credit hour course provides clinical work in the public school setting as part of field experience requirements for the undergraduate Teacher Preparation Program (TPP). University student is identified as Teacher Candidate and is required to spend six (6) hours per week for 12 weeks in an assigned classroom under the supervision of an Instructional Leadership Team (ILT). Block 1 is the first semester of the co-teaching assignment (2 semesters) in which Teacher Candidate and Cooperating Teacher are considered co-teachers for the class. This course integrates the principles of Experiential Learning and meets the criterion for internship. Prerequisite: Approved field-based assignment by the Teacher Preparation Program.

**ED 496. Block 2 - Co-Teaching Practicum for Certification Candidates (EL). 3 Hours.** This course provides clinical work in a public school setting as part of field experience requirements for the undergraduate Teacher Preparation Program (TPP). University student is identified as Teacher Candidate and is required to spend 72 full public school days in an assigned classroom under the supervision of an Instructional Leadership Team (ILT). Block 2 is the second semester of the co-teaching assignment (2 semesters) in which Teaching Candidate and Cooperating Teacher are considered co-teachers for the class. This course integrates the principles of Experiential Learning and meets the criterion for internship. Prerequisite: Successful completion of [ED 495](#); passing scores on both TExES PPR and TExES Content exams appropriate for the level and certification being sought; continued acceptance in a public school classroom.

**ITED 350. Technologies for Instruction, Learning, and Communication. 3 Hours.** This course is designed to develop a comfort with technology and its application to communication. Emphasis is placed on computer assisted presentations, software/hardware analysis, and the design and execution of instruction using electronic means. Previously offered as COMM 350.

**MATH 2413. Calculus I. 4 Hours.** This course provides a rigorous study of the concepts and applications of limits and continuity; the Fundamental Theorem of Calculus; definition of the derivative of a function and techniques of differentiation; applications of the derivative to maximizing or minimizing a function; the chain rule, mean value theorem, and rate of change problems; curve sketching; definite and indefinite integration of algebraic, trigonometric, and

Effective September 1, 2019 – August 31, 2024.

This unofficial degree plan is for informational purposes only.  
Please contact [Jennifer.perez@tamut.edu](mailto:Jennifer.perez@tamut.edu) for questions.

transcendental function, with an application to calculation of areas. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 1314](#) and [MATH 1316](#) with a C or better, or [MATH 2412](#) with a C or better. Placement will also be determined by the Math Placement Exam score.

**RDG 343. Reading Beyond the Primary Grades. 3 Hours.** This course teaches content area teachers how to help their students learn from textbooks, including techniques for evaluating both textbooks and students. Coping with the reading, demands of textbooks, and study skills will be learned.

**SPED 410. Introduction to Individual with Exceptionalities. 3 Hours.** This course develops students' foundational knowledge of historical perspectives, educational principles, laws, and professional ethics and roles in the fields of special education and English Language Learners (ELL). It focuses on the learning and behavioral characteristics of diverse learners, including students with exceptionalities (which includes disabilities, Attention Deficit Hyperactivity Disorders, Dyslexia, and Gifted/Talented) students who are ELL and students who are Culturally and Linguistically Diverse Exceptional (CLDE) learners. Additionally, this course introduces instructional strategies, appropriate curriculum, accommodations, modifications, and assistive technology to ensure the success of all learners.

**SPED 418. Research, Trends, and Issues in Education. 3 Hours.** This course presents current research, issues, and trends in education, specifically emphasizing the teaching-learning process to meet specific student learning needs. Emphasis is placed on teacher candidates integrating best practices in the teaching-learning process including: 1) Strength-based strategies, 2) Understanding by Design, 3) Differentiation, 4) Differentiation for Neurodiversity, 5) State Accountability Testing, and 6) Teacher Evaluation. Prerequisite: Admission to the Teacher Preparation Program.

Effective September 1, 2019 – August 31, 2024.

This unofficial degree plan is for informational purposes only.  
Please contact [Jennifer.perez@tamut.edu](mailto:Jennifer.perez@tamut.edu) for questions.