

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

Associate of Science in 7-12 Mathematics to
Bachelor of Science in Mathematics, 7-12 Mathematics Certification

NTCC		A&M-TEXARKANA	
COURSES	HOURS	COURSES	HOURS
ENGL 1301	3	MATH 2320	3
SPCH 1315 (or) SPCH 1321	3	MATH 321	3
MATH 2412	4	MATH 334	3
PHYS 1401*	4	MATH 357	3
PHYS 1402*	4	MATH 380	3
HIST 2321 (or) SPAN 2311	3	MATH 430	3
ARTS 1301*	3	MATH 437	3
HIST 1301	3	MATH 493	3
HIST 1302	3	RDG 343	3
GOVT 2305	3	UD Electives	12
GOVT 2306	3	ED 311	3
PSYC 2301	3	ED 321	3
ENGL 1302	3	BLOCK I	
MATH 2413	4	ED 331	3
EDUC 1301	3	ED 495	3
MATH 1342	3	BLOCK II	
MATH 2414	4	ED 496	3
MATH 2415	4	SPED 418	3
OTHER REQUIREMENTS:			
MATH 2305	3		
MATH 2318	3		
2.8 Minimum GPA			
TOTAL	66	TOTAL	123

*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

UD= Upper Division

LD= Lower Division

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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 15 hours in Content Area with no grade below C

COURSE DESCRIPTIONS

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.

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

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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 2305. Discrete Mathematics. 3 Hours. This course provides a rigorous study of the concepts and applications of topics designed to prepare math, computer science, and engineering majors for a background in abstraction, notation, and critical thinking for the mathematics most directly related to computer science. Topics include: logic, relations, functions, basic set theory, countability and counting arguments, proof techniques, mathematical induction, combinatorics, discrete probability, recursion, sequence and recurrence, elementary number theory, graph theory, and mathematical proof techniques. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2413](#) with a C or better.

MATH 2318. Linear Algebra. 3 Hours. This course provides a rigorous study of the concepts and applications of systems of linear equations, matrices, vector spaces, determinants, eigenvectors, eigenvalues, and linear transformations. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2414](#) with a C or better.

MATH 2412. Pre-Calculus. 4 Hours. This course provides a rigorous study of the concepts and applications of the fundamental topics of calculus including algebraic functions and their graphs, trigonometric functions and identities, polynomial, rational, exponential, and logarithmic functions, solutions to equations and inequalities, analytic geometry, and polar coordinates. This course is designed to prepare STEM majors for success in calculus. Appropriate computer software and hand held technologies will be utilized. Prerequisite:

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[MATH 1314](#) with a C or better or the equivalent preparation by STEM department chair permission. Placement will also be determined by the Math Placement Exam score.

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 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.

MATH 2414. Calculus II. 4 Hours. This course provides a rigorous study of the concepts and applications of integration, trigonometric functions, sequences and series, indeterminate forms, improper integrals, and elementary differential equations. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2413](#) with a C or better.

MATH 2415. Calculus III. 4 Hours. This course provides a rigorous study of the concepts and applications of three dimensional analytic geometry and vectors, differentiation and integration of vector-valued functions and motion in space, arc length and curvature, functions of several variables, partial derivatives, multiple integrals, and integration in vector fields. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2414](#) with a C or better.

MATH 289. Independent Study in Mathematics. 1-4 Hours. This course provides an option for individualized instruction and research. It may be repeated when topics vary. Prerequisite: Instructor approval.

MATH 321. College Geometry. 3 Hours. This course provides a rigorous study of the concepts and applications of the properties of finite geometrics and of points, lines, triangles, and circles in Euclidean geometry. Non-Euclidean geometries will also be studied and contrasted. This course will be taught with a discovery approach in which students scaffold their comprehension through careful axiomatic study. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2413](#) with a C or better.

MATH 334. Introduction to Abstract Algebra. 3 Hours. This course provides a rigorous study of the concepts and applications of the properties of the integers, permutations, groups, rings, integral domains, and fields. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2414](#) with a C or better.

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MATH 352. Math Foundations and Applications. 3 Hours. This course provides a rigorous study and review of the concepts of algebra, geometry, probability, statistics, trigonometry, and calculus. Other topics may include elements from number theory, linear algebra, and abstract algebra. This course will be driven by applications of real-world problems with an emphasis on problem-solving skills. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2413](#) with a C or better.

MATH 357. Probability and Statistics. 3 Hours. This course provides a rigorous study of the concepts and applications of probability, discrete and continuous distribution, estimation, and hypothesis testing using concepts from calculus. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2414](#) with a C or better.

MATH 426. Problem Solving. 3 Hours. Effective problem solving strategies will be applied to various examples from areas such as algebra, geometry, probability, calculus, trigonometry, number theory, discrete math, linear algebra, and logic. The scope and sequence will be formative in nature and use a discover approach to allow students to scaffold their critical thinking skills into a mathematical problem solving rubric. Logical reasoning will be emphasized in all strategies to distinguish the importance of the process of problem solving rather than just finding the answer. Appropriate computer software and hand held technologies will be utilized. With pre-service math teachers in mind, this course will also focus on the pedagogy of teaching these skills to 7-12 grade mathematics students. Prerequisite: [MATH 2414](#) with a C or better.

MATH 430. Mathematical Modeling. 3 Hours. This course provides a rigorous study of the concepts and applications of techniques used to model data related to real-world systems and scenarios from areas such as physics, biology, pharmacology, chemistry, ecology, sociology, astronomy, and archeology. Discrete and continuous models, theoretical and empirical models, deterministic and probability models and analytic and simulation models will be considered. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2414](#) with a C or better.

MATH 437. Number Theory. 3 Hours. This course provides a rigorous study of the concepts and applications of the properties of integer representations and operations, analysis and complexity of algorithms, mathematical induction, divisibility, primes and composites, congruences and systems, the Fundamental Theorem of Arithmetic, Pythagorean triples, multiplicative functions, and cryptology. Appropriate computer software and hand held technologies will be utilized. Prerequisite: [MATH 2414](#) with a C or better.

MATH 493. Capstone in Mathematics. 3 Hours. This is the conclusion of preparation of a portfolio of mathematical experiences composed of artifacts from throughout a student's time in upper-level mathematics classes. Presentation of a selected portfolio artifact will be required. Students will be graded on Satisfactory (S) or Unsatisfactory (U) basis. Prerequisite: Senior standing and instructor permission.

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MATH 499. Independent Research. 1-6 Hours. This is an independent research in Math conducted by a student under the guidance of a faculty member of his or her choice. The student is required to maintain a research journal and submit a project report by the end of the semester and potentially make an oral presentation on the project. SCH and hours are by arrangement and, with a change in content, this course may be repeated for credit. Prerequisite: Consent of instructor.

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.

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