

DEPARTMENT OF MATHEMATICS

MATHEMATICS (MATH)

Mission

Provide challenging experiences in Mathematics, and Physical Sciences which prepare graduates to pursue additional study in graduate, medical/dental, and other professional schools.

The Mathematics Program:

1. Provides opportunities for all students to develop quantitative and problem-solving skills.
2. Provides experiences that enable graduates to find employment in STEM-related careers.
3. Provides opportunities for majors to complete a cooperative education experience in their disciplines.

Objectives

1. To improve critical thinking and problem-solving skills of all students.
2. To prepare department majors for medical/dental, graduate, and professional schools.
3. To provide quality general education courses that produce students with skills required for successful careers.

Specific Competencies/Skills

1. Knowledge of the major concepts in Physics, Physical Science, and Mathematics.
2. Proficiency in scientific writing, oral and visual presentations, and computer applications.
3. Proficiency in data analysis and statistical procedures.
4. Application of research techniques.
5. Proficiency in using equipment and technology in areas of the major field

The Mathematics major course of study includes a series of Core Curriculum courses, Core Math courses and Advanced math courses. A student must earn a grade of “C” or better in all courses counted toward the major or minor. The total number of semester credit hours required for the degree is 120. The 120 credit hours are as follows:

A. HT Core Curriculum Courses **53 credit hours**

Requirements for a Bachelor of Arts (B.A.) Degree in Mathematics (38 hours)

B. Department Core Requirements **23 credit hours**

Required Courses

| | |
|-----------------------------------|---------|
| MATH 1342 Introductory Statistics | 3 hours |
| MATH 2318 Linear Algebra | 3 hours |

| | |
|--|---------|
| MATH 2413 Calculus 1 | 4 hours |
| MATH 2414 Calculus 2 | 4 hours |
| MATH 2415 Calculus 3 | 4 hours |
| MATH 3333 Probability | 3 hours |
| MATH 4147 Senior Seminar (Fall and Spring) | 2 hours |

C. Advanced Elective Courses 15 credit hours

In addition, Math majors are to select any five (5) courses from those listed below:

| | |
|---|---------|
| MATH 2305 Discrete Mathematics | 3 hours |
| MATH 2320 Differential Equations | 3 hours |
| MATH 2417 Advanced Calculus | 3 hours |
| MATH 3331 Modern Algebra | 3 hours |
| MATH 3332 Complex Analysis | 3 hours |
| MATH 3334 General Topology | 3 hours |
| MATH 3335 Numerical Analysis | 3 hours |
| MATH 3337 Real Analysis | 3 hours |
| MATH 3338 Special Topics | 3 hours |
| MATH 3345 Mathematics Internship | 3 hours |
| MATH 3398 Number Theory | 3 hours |
| MATH 4346 Mathematics Research Projects | 3 hours |

Requirements for a Bachelor of Science (B.S.) Degree in Mathematics

1. The required courses for a Bachelor of Arts in Mathematics degree
2. Eight (8) hours of Physics PHYS 2425* and PHYS 2426
3. Four (4) additional hours from CHEM 1411*, BIOL 1406*, or BIOL 1407*
4. Two (2) courses: COSC 1312 Programming Foundations I, and
COSC 1323 Programming Foundations II

Requirements for a Minor in Mathematics (20 hours)

- | | |
|---|---------|
| 1. MATH 2413 Calculus I | 4 hours |
| 2. MATH 2414 Calculus II | 4 hours |
| An additional 12 semester hours selected from | |
| 3. MATH 1342 Introductory Statistics | 3 hours |
| 4. MATH 2415 Calculus 3 | 4 hours |
| 5. MATH 3333 Probability | 3 hours |
| 6. MATH 2318 Linear Algebra | 3 hours |
| 7. MATH 2305 Discrete Mathematics | 3 hours |

Students transferring from another University, please reference division requirements listed under the Department of Natural Sciences.

**SUGGESTED COURSE SEQUENCE
FOR THE B.A./B.S. MATHEMATICS MAJOR (120 hours)**

Year 1

| Fall 1 | | | Spring 1 | | |
|----------------|----------------------------------|----|-----------------|----------------------------------|----|
| UNIV 1101 | Freshman Seminar I | 1 | UNIV 1102 | Freshman Seminar II | 1 |
| KINE 1304/1338 | Health and Wellness | 3 | PSCI 1301 | US Government | 3 |
| Language I | Spanish/ French/Chinese | 3 | MATH 2412* | Pre-Calculus | 4 |
| ENGL 1301 | Introduction College Composition | 3 | Language II | Spanish/ French/Chinese | 3 |
| COSC 1300 | Introduction to Computers | 3 | ENGL 1302 | College Rhetoric and Composition | 3 |
| KINE 1100 | Physical Education | 1 | | | |
| Total Hours | | 14 | Total Hours | | 14 |

Year 2

| Fall 2 | | | Spring 2 | | |
|------------------------|--|----|------------------------|---|----|
| MATH 2413 | Calculus I | 4 | MATH 2414 | Calculus II | 4 |
| PHYS 2425 | Physics I ^{B.S.} | 4 | PHYS 2426 | Physics II ^{B.S.} | 4 |
| ENGL 2331 | World Literature (Lit./Gen. Diversity) | 3 | PSYC 1301 | Behavioral Science | 3 |
| HIST 1301 HIST 1302 | US History I or US History II (Writing Intensive) | 3 | PHIL 2301 RELI 2302 | Philosophy and Ethics or Comparative Religion (Gen. Div/ Writing Intensive) | 3 |
| Total Hours | | 14 | Total Hours | | 14 |

Year 3

| Fall 3 | | | Spring 3 | | |
|---------------|---|----|-----------------|--------------------------------------|----|
| MATH 2415 | Calculus III | 4 | MATH 3333 | Probability | 3 |
| MATH 2318 | Linear Algebra | 3 | MATH | 2000 or 3000 level Electives | 3 |
| MATH 1342 | Introductory Statistics | 3 | MATH | 2000 or 3000 level Electives | 3 |
| COMM 1315 | Public Speaking | 3 | COSC 1312 | Programming Foundations I*** B.S. | 3 |
| ENGL 2304 | Intro to African American Literature (AA Diversity) | 3 | | Fine Arts Core | 3 |
| Total Hours | | 16 | Total Hours | | 15 |

Year 4

| Fall 4 | | | Spring 4 | | |
|---------------|--|----|----------------------------|---|----|
| MATH 4147 | Senior Seminar | 1 | MATH 4147 | Senior Seminar | 1 |
| MATH | 3000 or 4000 level Electives | 6 | MATH | 2000 or 3000 level Electives | 3 |
| COSC 1323 | Programming Foundations II *** B.S. | 3 | MATH 3338_2 / MATH 4346 | Special Topics or Math Research/Projects | 3 |
| Electives | | 3 | Electives | | 9 |
| | Science elective** B.S. | 4 | | | |
| Total Hours | | 17 | Total Hours | | 16 |

*Assuming student tests into MATH 2412 Pre-Calculus

** CHEM 1411, BIOL 1406, or BIOL 1407

*** Two (2) courses: COSC 1312 Programming Foundations I, and COSC 1323 Programming Foundations II

SUGGESTED COURSE SEQUENCE
B.A. in MATH with Teacher Certification (123 Hours)

Year 1

| Fall 1 | | | Spring 1 | | |
|-------------|----------------------------------|----|------------------------|---|----|
| UNIV 1101 | Freshman Seminar I | 1 | UNIV 1102 | Freshman Seminar II | 1 |
| ENGL 1301 | Introduction College Composition | 3 | ENGL 1302 | College Rhetoric and Composition | 3 |
| MATH 1314 | College Algebra | 3 | COMM 1315 | Public Speaking | 3 |
| COSC 1300 | Introduction to Computers | 3 | EDUC 1301 | Introduction to Teaching | 3 |
| KINE 1100 | Physical Education | 1 | Language II | Spanish/ French/Chinese | 3 |
| Language I | Spanish/ French/Chinese | 3 | KINE 1304 KINE 1338 | Health & Wellness or Concepts of Fitness | 3 |
| Total Hours | | 14 | Total Hours | | 16 |

Year 2

| Fall 2 | | | Spring 2 | | |
|------------------------|--|----|------------------------|--|----|
| MATH 2413 | Calculus I | 4 | MATH 2414 | Calculus II | 4 |
| | Natural Science | 4 | | Natural Science | 4 |
| ENGL 2304 | Intro African American Literature (AA Diversity) | 3 | | Fine Arts | 3 |
| HIST 1301 HIST 1302 | US History I or US History II (Writing Intensive) | 3 | PSCI 1301 PSCI 1302 | American Government or Texas Government | 3 |
| PHIL 2301 RELI 2302 | Philosophy and Ethics or Comparative Religion (Gen. Div) (Writing Intensive) | 3 | MATH 1342 | Introductory Statistics | 3 |
| Total Hours | | 17 | Total Hours | | 17 |

Year 3

| Fall 3 | | | Spring 3 | | |
|-------------|--|----|-------------|----------------------------------|----|
| MATH 1348 | Geometry | 3 | MATH 2415 | Calculus III | 4 |
| MATH 2318 | Linear Algebra | 3 | MATH | 2000 or 3000 level Electives | 3 |
| MATH 3333 | Probability | 3 | MATH | 2000 or 3000 level Electives | 3 |
| EDUC 3303 | Introduction in a Multicultural Soc (Writing Intensive/Gen. Div) | 3 | EDUC 4306 | Assess & Differentiation of Inst | 3 |
| MATH | 2000 or 3000 level Elective | 3 | RDNG 3321 | Language Arts across Curriculum | 3 |
| Total Hours | | 16 | Total Hours | | 15 |

Year 4

| Fall 4 | | | Spring 4 | | |
|-------------|------------------------------------|----|-----------|--------------------------|----|
| MATH 4147 | Senior Seminar | 1 | EDUC 4307 | Student Teaching Seminar | 3 |
| MATH 1360 | Math for Secondary Schools | 3 | EDUC 4907 | Student Teaching | 9 |
| EDUC 3365 | TEKS Curriculum & Exam Prep | 3 | | | |
| MATH | 3000 or 4000 level Electives | 3 | | | |
| EDUC 4302 | Classroom Management | 3 | | | |
| EDUC 3301 | Instr. for Engl. Language Learners | 3 | | | |
| Total Hours | | 16 | | | 12 |

*Math majors are required to take fifteen hours of math electives from the following courses: MATH 2417, 3331, 3334, 3398, 3337, 3332, 2320, 3335, 3338, and 4346.

COURSES IN MATHEMATICS (MATH)

MATH 0300 Bridge Seminar for Algebra

3 Pre-University Credit Hours

This seminar course focuses instruction in reviewing basic mathematics concepts required for success in Introduction to Algebra and College Algebra Courses. Students who complete this seminar with a C or better earn college admission and take placement exams to determine MATH 0330 or 1314 or 1314Q enrollment.

Prerequisite: None

Offered: Fall/Spring Yearly

MATH 0330 Introduction to Algebra

3 Pre-University Credit Hours

The required competencies for successful completion of this course require demonstration of MATH 0330 competencies related to real numbers, linear equations, inequalities, factoring polynomials, and operations on polynomial and rational expressions. Students must pass this course with a grade of "C" or better to enroll in MATH 1312 or MATH 1314.

Prerequisite: NONE

Offered: Fall/Spring Yearly

MATH 0330Q Introduction to Algebra with Review

3 Pre-University Credit Hours

This is a five-day per week intensive course combining review of basic math skills with MATH 0330 content. The basic math concepts reviewed include operations of whole numbers, fractions and decimals, ratios, and percent, rounding, prime numbers, factors and least common multiples. The required competencies for successful completion of this course require demonstration of MATH 0330 competencies related to real numbers, linear equations, inequalities, and factoring polynomials. **Students must pass this course with a grade of "C" or better to enroll in MATH 1314.**

Offered: Fall/Spring Yearly

MATH 1312 Mathematics for Liberal Arts

3 Credit Hours

This course will provide students with a survey of topics in mathematics. The students who take this course generally are in nursing, the liberal arts, communication, or social sciences. This course will develop student's quantitative reasoning skills, their appreciation for the beauty of mathematics as a discipline, and their understanding of the different ways in which mathematics is used. Students must pass this course with a grade of "C" or better

Prerequisite: None

Offered: Fall/Spring Yearly

MATH 1314 College Algebra

3 Credit Hours

Successful completion of this course requires demonstration of MATH 1314 competencies related to graphing, solving, and application of functions such as linear, quadratic, polynomial of higher degree, rational, exponential, and logarithmic. The course will also include operations on functions and an introduction to matrices.

Prerequisite: Entrance Exam Placement or "C" or better in MATH 0330 or MATH 0330Q

Offered: Fall/Spring Yearly

MATH 1314Q College Algebra with Review

3 Credit Hours

This is a five- day- per- week intensive course combining review of MATH 0330 concepts with MATH 1314 content. The introduction to algebra concepts reviewed includes real numbers, linear equations, inequalities, and factoring polynomials. Successful completion of this course requires demonstration of MATH 1314 competencies related to graphing, solving, and application of functions such as linear, quadratic, polynomial of higher degree, rational, exponential, and logarithmic. The course will also include operations on functions and an introduction to matrices.

Prerequisite: Entrance Exam Placement or "C" or better in MATH 0330 or MATH 0330Q

Offered: Fall/Spring Yearly

MATH 1314_0330 Algebra Express**3 Credit Hours**

This is a five- day- per- week intensive course combining concepts with MATH 1314 content with review of MATH 0330. The introduction to algebra concepts reviewed includes real numbers, linear equations, inequalities, and factoring polynomials. Successful completion of this course requires demonstration of MATH 1314 competencies related to graphing, solving, and application of functions such as linear, quadratic, polynomial of higher degree, rational, exponential, and logarithmic. The course will also include operations on functions and an introduction to matrices.

Prerequisite: Math score of 340-349 in TSI or 930-949 in TSIA2**Offered: Fall/Spring Yearly****MATH 1324 Mathematics for Business and Economics****3 Credit Hours**

A course in finite mathematics for business and economics students including sets, basic algebraic properties, linear equations and inequalities, functions and graphs, the exponential and logarithmic functions, the mathematics of finance, systems of linear equations and matrices, linear inequalities and linear programming, the simplex method, and an introduction to probability.

**Prerequisite: Entrance Exam Placement or
"C" or better in MATH 0330 or MATH 0330Q****Offered: Fall/Spring****MATH 1342 Introductory Statistics****3 Credit Hours**

This is a first course in statistics that requires knowledge of the fundamental procedures for data organization and analysis. Topics include frequency distributions, graphing, measures of central tendency, dispersion, positions, binomial distribution, normal curves, probability calculation, t-test, chi-square, F-test, hypothesis testing, and statistical estimation.

Prerequisite: MATH 0330**Offered: Fall/Yearly****MATH 1348 Geometry****3 Credit Hours**

The purpose of this course is to introduce the student to the fundamentals of plane and solid geometry. Desirable in its own right, this foundation is also essential for the study of higher mathematics and exceedingly helpful in everyday life. Topics are: axioms, angle measurement, proofs, constructions, perpendicular lines and planes, parallel lines and planes, ratio, proportion, similarity, area and volume.

Prerequisite: MATH 1314**Offered: As Needed****MATH 1350 Fundamental Concepts of Math
for Elementary Education I****3 Credit Hours**

A mathematics course which covers the Texas Essential Knowledge and Skills (TEKS) objectives and the TExES objectives for grades EC---4. Emphasis will be placed on standards of the National Council of Teachers of Mathematics (NCTM). Topics include numeration systems, number systems, non-decimal number bases, algorithms, measurement, whole number algorithms, number theory, fractions, decimals and percents. These topics include computer solutions to many problems using student designed programs and provided programs; real vector spaces, subspaces, bases, dimensions of vector spaces, and spanning sets; eigenvalues, eigenvectors, and linear transformations.

Prerequisite: MATH 1314**Offered: Fall As Needed****MATH 1351 Fundamental Concepts of Mathematics
for Elementary Education II****3 Credit Hours**

A mathematics course which covers TEKS objectives and the TExES objectives for grades K---4. Emphasis will be placed on standards of the NCTM. Topics include rational numbers, real numbers, functions, graphs, statistics, probability, geometric shapes, measurement, geometry using congruence and similarity, coordinate geometry, and geometry using transformations. Technology, including computers and graphing calculators will be used throughout the course.

Prerequisite: Field Experience and MATH 1350**Offered: Spring as Needed**

MATH 1360 Fundamental Concepts of Math for Secondary Schools 3 Credit Hours

A survey of topics in secondary school mathematics including geometry, linear programming, history of mathematics, graphing calculator, and computer applications in mathematics.

Prerequisite: MATH 1314

Offered: As Needed

MATH 2146 Mathematics Research/Project 1 Credit Hour

The student plans and implements an independent mathematical study under the direction of faculty, using facilities available at Huston-Tillotson University or other sites if recommended by the mathematics faculty. Or the student may work with a mathematics faculty member in a specific research area. Course may be repeated for a maximum of 10 credits.

Prerequisite: Instructor approval

Offered: Fall/Spring Yearly

MATH 2246 Mathematics Research/Project 2 Credit Hours

The student plans and implements an independent mathematical study under the direction of faculty, using facilities available at Huston-Tillotson University or other sites if recommended by the mathematics faculty. Or the student may work with a mathematics faculty member in a specific research area. Course may be repeated for a maximum of 10 credits.

Prerequisite: Instructor approval

Offered: Fall/Spring Yearly

MATH 2305 Discrete Mathematics 3 Credit Hours

A required course for computer science majors. This course covers selected mathematical concepts that facilitate a deeper understanding of computer science and programming. It introduces number systems and computer arithmetic. Topics and concepts include sets, group codes, logic and truth table, Boolean algebra and its application to computer logic design, relations, and functions. Other topics covered include elementary matrix operations, permutations, combinations, and counting techniques.

Prerequisite: MATH 1314

Offered: Spring/Yearly

MATH 2412 Pre-Calculus 4 Credit Hours

This course will cover exponential and logarithmic, and trigonometric functions and equations, systems of linear and non-linear equations, matrices, the unit circle, and trigonometric identities. Laws of sines and cosines.

Prerequisite: MATH 1314

Offered: Spring/Yearly

MATH 2318 Linear Algebra 3 Credit Hours

This course covers matrices and their operations, special matrices including identities, symmetric and skew symmetric, idempotent, row operations on matrices in solving systems of equations, computer solutions to many problems using student designed and given programs, real vector spaces, subspaces, bases, dimensions of vector spaces, spanning sets, eigenvalues, eigenvectors, and linear transformations.

Prerequisite: MATH 1314

Offered: Fall as Needed

MATH 2320 Differential Equations 3 Credit Hours

This course covers solutions of linear and nonlinear ordinary differential equations, and utilization of Laplace transform to solve ordinary differential equations.

Prerequisite: MATH 2414

Offered: Spring as Needed

MATH 2413 Calculus I**4 Credit Hours**

The standard first course in calculus. Topics include functions and their graphs, composition of functions, limits of functions, proofs, continuous functions, derivatives of algebraic functions, Newton's method, Rolle's Theorem, mean value theorem, local and extreme values of functions, application problems, related rates, concavity, higher order derivatives, and implicit differentiation.

Prerequisites: MATH 1314 and 2412, or Entrance Exam Placement**Offered: Fall/Yearly****MATH 2414 Calculus II****4 Credit Hours**

A second standard course in calculus. Topics include definite and indefinite integrals, using integrals to compute areas, volumes, growth and decay, differentiation and integration of algebraic and transcendental functions, trigonometric substitutions, partial fractions, tables of integrals, and application.

Prerequisite: MATH 2413**Offered: Spring/Yearly****MATH 2415 Calculus III****4 Credit Hours**

A standard third course in calculus. Topics include infinite series, vector and analytical geometry, limits and continuity in three-space, gradients, tangent planes, partial and directional derivatives, polar coordinates, application of multiple integrals to area, volume, centroids, partial differentiation, and applications.

Prerequisite: MATH 2414**Offered: Fall/Yearly****MATH 2317 Advanced Calculus****3 Credit Hours**

Topics covered in this course include Vector-valued functions and their analysis, the geometry of Euclidean n -space, partial derivatives, functions of several variables, Taylor's theorem, infinite sequences and series, line and surface integral, LaGrange multipliers, multiple integrals, Green's and Stokes' theorems.

Prerequisite: MATH 2415**Offered: as Needed****MATH 3331 Modern Algebra****3 Credit Hours**

This course in abstract algebra utilizes the postulation approach. Topics considered include binary operations, mappings, number theory, rings, subrings, groups, subgroups, and fields.

Prerequisite: MATH 1314**Offered: Fall as Needed****MATH 3332 Complex Analysis****3 Credit Hours**

A first course in complex analysis covering complex numbers, analytic functions, contour integration, power series, analytic continuation, sequences of analytic functions, conformal mapping of simply connected regions, and related topics.

Prerequisite: MATH 2415**Offered: Spring as Needed****MATH 3333 Probability****3 Credit Hours**

This is a course in the understanding of probability. The following topics are covered in this course: Discrete and continuous Probability functions, binomial, Poisson, normal, geometric, and gamma distribution, random variables, joint density, conditional densities, expected values, estimations, hypothesis testing, goodness-of-fit tests, and regression.

Co-requisite or Prerequisite: MATH 2414**Offered: Spring as Needed****MATH 3334 General Topology****3 Credit hours**

Topics include introduction to sets, relations, openness, closedness, convergence, continuity, compactness, connectedness and fixed points in topological spaces with special emphasis on Euclidean spaces and metric spaces.

Prerequisite: MATH 1314**Offered: Fall as Needed**

MATH 3335 Numerical Analysis**3 Credit Hours**

This course covers polynomial forms and interpolation, divided differences, polynomial, uniform, least-squares, and splines approximation; orthogonal polynomials; numerical differentiation; integration; splines; B-splines; and numerical methods for solving initial and boundary value problems for ordinary differential equations.

Prerequisites: MATH 2415, 2318**Offered: Spring as Needed****MATH 3336 Numerical Techniques for Computer Science Majors****3 Credit Hours**

This course emphasizes the use of computers in solving problems in applied mathematics. Topics include number presentation, errors in computer arithmetic, portability issues, error classification, well-conditioned and ill-conditioned problems, and iterative approximation to mathematical problems.

Co-requisites: MATH 2318 and MATH 2414**Offered: Spring/Yearly****MATH 3337 Real Analysis****3 Credit Hours**

Topics covered in this course include real numbers, upper and bounds, intervals, mathematical induction, sequences and series, convergence, limits, continuity, derivatives, and integrals.

Prerequisite: MATH 2414**Offered: Spring as Needed****MATH 3338 Special Topics in Mathematics****3 Credit Hours**

This course covers selected topics in mathematics of special interest to students or instructors. Topics may be a more in-depth treatment of survey courses or cover a specialty in mathematics. Possible topics include Actuarial science, Data Science, Laplace transforms, Calculus of variation, Integral equations, History of Mathematics, Advanced differential equations, Advanced Numerical Techniques, and Finite Element Method for Engineering-Design.

Prerequisite: Instructor approval**Offered: Fall/Spring as Needed****MATH 3345 Mathematics Internship****3 Credit Hours**

This course will provide a supervised mathematics related experience in the industrial, governmental, private, or nonprofit sector for MATH major students. Academic internships support experiential education that allows students to integrate their disciplinary knowledge in a work environment. Mathematics Internship will provide entry-level, career-related experience, and workplace competencies that employers value when hiring new employees. Internships may also be used as an opportunity to explore career fields. A faculty member will supervise the internship and will conduct on-the-site visits.

Prerequisites: 18 Math Major Credits and Advisor Approval**Offered: Fall/Spring Yearly****MATH 3398 Number Theory****3 Credit Hours**

Number theory is the study of properties of numbers, in particular the integers and rational numbers. Questions in elementary number theory include divisibility properties of integers, properties of primes, congruencies, quadratic reciprocity, and integer solutions to basic equations (e.g., Diophantine equations). Even though number theory is one of the oldest disciplines in mathematics, it has recently contributed to many practical problems such as coding theory, cryptography, hashing functions or other tools in modern information technology.

Prerequisite: MATH 1314**Offered: as Needed****MATH 4147 Mathematics Senior Seminar Fall/Spring****1 Credit Hour**

Senior seminar courses are taken by all Mathematics majors. The student attends one discussion hour per week and at least one science seminar participation hour per week. Oral discussion, a written report and presentation on selected topics developed from information gathered from professional journals and reference books. In some cases, laboratory investigations with written reports may be substituted. Specific

requirements for the satisfactory completion of this course are outlined in the course syllabus for each semester.

Prerequisite: Senior Standing

Offered: Fall/Spring Yearly

MATH 4346 Mathematics Research/Project

3 Credit Hours

The 3 credit hours **Mathematics Research/Project** is an upper-level writing intensive course. The student plans and implements an independent mathematical study under the direction of faculty, using facilities available at Huston-Tillotson University or other sites if recommended by the mathematics faculty. Or the student may work with a mathematics faculty member in a specific research area. Course may be repeated for a maximum of 10 credits.

Prerequisite: Instructor approval

Offered: Fall/Spring Yearly

MATH 4446 Mathematics Research/Project

4 Credit Hours

The 3 credit hours **Mathematics Research/Project** is an upper-level writing intensive course. The student plans and implements an independent mathematical study under the direction of faculty, using facilities available at Huston-Tillotson University or other sites if recommended by the mathematics faculty. Or the student may work with a mathematics faculty member in a specific research area. Course may be repeated for a maximum of 10 credits.

Prerequisite: Instructor approval

Offered: Fall/Spring Yearly

PRE-ENGINEERING PROGRAM

(Huston-Tillotson University and Prairie View A&M University)

Mission

The Pre-engineering Program is to provide an opportunity for students to combine educational experiences at a small liberal arts college and a large state-supported university that lead to baccalaureate degrees in mathematics and engineering.

Huston-Tillotson University and Prairie View A&M University have developed a cooperative dual-degree program in mathematics and engineering. Under this program, Huston-Tillotson University students complete preliminary required courses and then transfer to Prairie View A&M University to complete degree requirements. Upon completion of all Pre-Engineering Program requirements, each student will be eligible to receive two degrees: a Bachelor of Science in Mathematics from Huston-Tillotson University and a Bachelor of Science in Engineering from Prairie View A&M University.

To be eligible for admission to the Pre-Engineering Program at Prairie View A&M University, students must complete at least 75 semester credit hours of course work at Huston-Tillotson University with a cumulative grade point average of 2.75 or higher on a scale of 4.0. To remain in the program while enrolled at Huston-Tillotson University, students must maintain a 2.75 or higher-grade point average.

The following are the engineering degrees that a student may pursue at Prairie View A&M University:

- Chemical Engineering
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Mechanical Engineering

A SUGGESTED COURSE SEQUENCE FOR THE PRE-ENGINEERING MAJOR*

| YEAR 1 | | | | | | | |
|--------------------|-----------|--|-----------|--------------------|---------------------------------|--|-----------|
| FALL | | | | SPRING | | | |
| UNIV | 1101 | Freshman Seminar I | 1 | UNIV | 1102 | Freshman Seminar II | 1 |
| Language I | | Spanish/ French/Chinese (General Diversity) | 3 | Language II | | Spanish/ French/Chinese (General Diversity) | 3 |
| ENGR | 1111 | Introduction to Engineering | 1 | ENGR | 1322 | Computer Application in Engineering | 3 |
| KINE | 1100 | Physical Education | 1 | MATH | 2412* | Pre-Calculus | 4 |
| KINE | 1304/1338 | Health and Wellness | 3 | ENGL | 1302 | College Rhetoric and Composition | 3 |
| ENGL | 1301 | Introduction College Composition | 3 | PSCI | 1301 | US Government | 3 |
| COSC | 1300 | Introduction to Computers | 3 | | | | |
| Total Hours | | | 15 | Total Hours | | | 17 |
| YEAR 2 | | | | | | | |
| FALL | | | | SPRING | | | |
| ENGR | 2311 | Economy Analysis and Technology Application | 3 | ENGR | 2322 | Engineering Mechanics I: Statics | 3 |
| MATH | 2413 | Calculus I | 4 | MATH | 2414 | Calculus II | 4 |
| PHYS | 2425 | Physics I | 4 | PHYS | 2426 | Physics II | 4 |
| COMM | 1315 | Public Speaking | 3 | | | Behavioral Science | 3 |
| HIST | 1301/1302 | U.S. History I or II (Writing Intensive) | 3 | PHIL | 2301 or | Philosophy and Ethics or | 3 |
| | | | | RELI | 2302 | Comparative Religion (Gen.Div) (Writing Intensive) | 3 |
| Total Hours | | | 17 | Total Hours | | | 17 |
| YEAR 2 | | | | | | | |
| SUMMER | | | | | | | |
| MATH | 2415 | Calculus III | 4 | MATH | 2320 | Differential Equations | 3 |
| YEAR 3 | | | | | | | |
| FALL | | | | SPRING | | | |
| MATH | 3337 | Real Analysis | 3 | MATH | 3335 | Numerical Analysis | 3 |
| MATH | 2318 | Linear Algebra | 3 | MATH | 3333 | Probability | 3 |
| MATH | 3332 | Modern Algebra | 3 | MATH | 2305 or COSC 1323 (BS Elective) | | 3 |
| | | Diversity Core I | 3 | | | Diversity Core II | 3 |
| | | Fine Arts Core | 3 | ENGL | 2331 | World Literature | 3 |
| Total Hours | | | 15 | Total Hours | | | 15 |

[∞] Assuming student tests into MATH 2412 Pre-Calculus

***NOTE: After completing the above courses at HT, the student will transfer to Prairie View A & M University in Prairie View, Texas to complete the remainder of the Engineering coursework.**

COURSES IN ENGINEERING (ENGR)
For 3/2 “Dual Degree” Engineering/Math Program
with Prairie View A&M University

ENGR 1111 Introduction to Engineering

1 Credit Hour

This course introduces students to basic engineering, computer science and technology concepts. Students will become aware of the various disciplines of engineering, computer science and technology, the ethical and professional responsibilities in these fields, as well as engineering creativity and design.

Prerequisite: None

Offered Fall/As Needed

ENGR 1322 Computer Application in Engineering

3 Credit Hours

This course will focus on the following: C++ and MatLab Programming language; fundamentals, program looping, conditioning statements, arrays, functions, structures, character strings, pointers, preprocessors, input and output. The course also involves engineering problem solving using computers and the use of engineering software and commercial packages.

Prerequisite: MATH 1314 and COSC 1300

Offered Spring/As Needed

ENGR 2311 Economy Analysis and Technology Application

3 Credit Hours

Beginning with a review of the fundamental concepts of engineering economics, this course will familiarize the students with analyzing and forecasting engineering R&D projects and portfolios. Also, there will be an emphasis on determining uncertainty of outcomes and how it can be minimized.

Prerequisites or co-requisites: Sophomore standing, MATH 1124

Offered Fall/As Needed

ENGR 2322 Engineering Mechanics I: Statics

3 Credit Hours

This course will focus on the following: fundamental concepts and principles; vector algebra and applications; equilibrium of particles and rigid bodies in two and three dimensions, moments and couples; distributed forces, centroids, moments of inertia, friction, and introduction to analysis of structures.

Pre-requisites PHYS 2525 (Physics I)

Offered Spring/As Needed