Mathematics is both an exact science and a highly creative endeavor; a field of study that develops problem-solving skills and a passion for inquiry. Mathematics majors are surprisingly attractive to many professional branches in our society, particularly intelligence, technology, finance, security, engineering and physics. Mathematics Majors with Teacher Certification are attractive to the growing demand for teachers in high schools, middle schools and elementary schools. A BS in Mathematics will prepare the graduate for a competitive position in society and provide the necessary preparation graduate for an exciting and rewarding teaching position and for graduate studies.

A – GENERAL EDUCATION CORE – 42 HOURS

Students must fulfill the General Education Core requirements. The courses listed below satisfy both degree requirements and General Education core requirements.

**Required**

**020 - Mathematics – 3 hours**
MATH 2413 Calculus I (or MATH 2487 Honors) three-hour lecture

**Recommended**

**030 - Life and Physical Sciences – 6 hours**
PHYS 2425 Physics for Scientist and Engineers I three-hour lecture
PHYS 2426 Physics for Scientist and Engineers II three-hour lecture

**080 - Social and Behavioral Sciences – 3 hours**
Choose from:
ECON 1301 Introduction to Economics
ECON 2301 Principles of Macroeconomics

**090 - Integrative and Experiential Learning – 5 hours**
PHYS 2425 Physics for Scientists and Engineers I one-hour lab
PHYS 2426 Physics for Scientists and Engineers II one-hour lab
CSCI 1380 Computer Science I

B – MAJOR REQUIREMENTS – 78 HOURS MINIMUM (51 advanced minimum)

1 – Mathematics Core – 33 hours (21 advanced)

MATH 2413 Calculus I (or MATH 2487 Honors) one-hour lecture
MATH 2414 Calculus II (or MATH 2488 Honors)
MATH 2415 Calculus III
MATH 2318 Linear Algebra
MATH 3341 Differential Equations
MATH 3350 Introduction to Mathematical Proof
MATH 3352 Modern Geometry I
MATH 3363 Modern Algebra I
MATH 3372 Real Analysis I
MATH 4337 Probability and Statistics I
MATH 4390 Mathematics Project

2 – Concentrations – 45 hours minimum (27 advanced minimum)

a – Applied Mathematics – 45 hours (33 advanced)

i – Applied Mathematics Core – 9 hours (9 advanced)
MATH 3331 Applied Statistics I
MATH 3343 Introduction to Mathematical Software
MATH 3349 Numerical Methods

ii – Advanced Mathematics Electives – 18 hours (18 advanced)
Choose from:
MATH 3332 Applied Statistics II
MATH 3345 Linear Optimization
MATH 3347 Elementary Cryptology
MATH 3361 Applied Discrete Mathematics
MATH 4342 Complex Variables
MATH 4344 Boundary Value Problems
MATH 4346 Integral Transforms

iii – Free Electives – 18 hours (6 advanced)

b – Pure Mathematics – 45 hours (33 advanced)
   i – Pure Mathematics Core – 12 hours (12 advanced)
      MATH 3349 Numerical Methods
      MATH 3365 Number Theory
      MATH 4342 Complex Variables
      MATH 4355 Topology
   
   ii – Advanced Mathematics Electives – 15 hours (15 advanced)
      Choose one:
      MATH 3341 Differential Equations
      MATH 3345 Linear Optimization
      MATH 3349 Numerical Methods
      MATH 3361 Applied Discrete Mathematics
      Choose two:
      MATH 4352 Modern Geometry II
      MATH 4359 Differential Geometry
      MATH 4364 Modern Algebra II
      MATH 4367 Advanced Linear Algebra
      MATH 4373 Real Analysis II
      Choose two 4000 level Mathematics courses.

   iii – Free Electives – 18 hours (6 advanced)

c – Secondary School – 46 hours (44 advanced)
   i – Secondary Mathematics Core – 25 hours (25 advanced)
      MATE 3317 Perspectives in Mathematics and Science
      MATE 3321 Functions and Modeling
      MATE 3322 Secondary Mathematics in a Technological Environment
      MATE 4329 Research Methods in Secondary Mathematics
      MATE 4423 Advanced Studies in Secondary Mathematics
      MATH 3326 History of Math
      MATH 3361 Applied Discrete Mathematics
      MATH 3365 Number Theory
   
   ii – UTeach Certification – 21 hours (19 advanced)
      Area of Certification: Mathematics (7-12)
      UTCH 1101 Inquiry Approaches to Teaching
      UTCH 1102 Inquiry-Based Lesson Design
      UTCH 3301 Knowing and Learning in Mathematics and Science
      UTCH 3302 Classroom Interactions
      UTCH 3303 Project-Based Instruction
      UTCH 4601 Apprentice Teaching
      UTCH 4101 Apprentice Teaching Seminar
      READ 4305 Content Area Literacy

d – Middle School – 48 hours (40 advanced)
   i – Middle School Mathematics Core – 27 hours (21 advanced)
      MATH 1350 Fundamentals of Mathematics I
      MATH 1351 Fundamentals of Mathematics II
      MATE 3301 Fundamentals of Middle School Mathematics
      MATE 3302 Fundamentals of Measurement and Geometry I
      MATE 3303 Fundamentals of Measurement and Geometry II
      MATE 3304 Fundamentals of Algebraic Structures
      MATE 3317 Perspectives in Mathematics and Science
      MATE 3321 Functions and Modeling
      MATE 4319 Research Methods in Middle School Mathematics
ii – UTeach Certification – 21 hours (19 advanced)
   Area of Certification: Mathematics (4-8)
   UTCH 1101 Inquiry Approaches to Teaching
   UTCH 1102 Inquiry-Based Lesson Design
   UTCH 3301 Knowing and Learning in Mathematics and Science
   UTCH 3302 Classroom Interactions
   UTCH 3303 Project-Based Instruction
   UTCH 4601 Apprentice Teaching
   UTCH 4101 Apprentice Teaching Seminar
   READ 4305 Content Area Literacy

e – Statistics – 45 hours (30 advanced)
   i – Statistics Core – 24 hours (21 advanced)
      MATH 1342 Elementary Statistical Methods (or MATH 1387 Honors)
      MATH 3331 Applied Statistics I
      MATH 3332 Applied Statistics II
      MATH 3334 Sampling
      MATH 3335 Applied Regression
      MATH 3343 Introduction to Mathematical Software
      MATH 3349 Numerical Methods
      MATH 4338 Probability and Statistics II
   ii – Advanced Mathematics Electives – 3 hours (3 advanced)
      Choose 3 advanced hours of MATH.
   iii – Free Electives – 18 hours (6 advanced)

f – Science and Engineering – 45 hours (27 advanced)
   i – Science and Engineering Core – 27 hours (21 advanced)
      Choose 27 hours, of which 21 must be advanced, from the College of Engineering and Computer Science and College of Science (excluding MATH and MATE).
   ii – Free Electives – 18 hours (6 advanced)

g – Economics – 45 hours (27 advanced)
   i – Economics Core – 24 hours (18 advanced)
      ECON 2301 Principles of Macroeconomics
      ECON 2302 Principles of Microeconomics
      ECON 3341 Econometrics
      ECON 3342 Business and Economics Forecasting
      ECON 3351 Macroeconomic Theory
      ECON 3352 Microeconomic Theory
      ECON 4361 Studies in Economics
      MATH 3343 Introduction to Mathematical Software
   ii – Advanced Mathematics Electives – 3 hours (3 advanced)
      Choose 3 advanced hours of MATH.
   iii – Free Electives – 18 hours (6 advanced)

TOTAL CREDIT HOURS FOR GRADUATION (MINIMUM) – 120 HOURS
TOTAL ADVANCED HOURS (MINIMUM) – 48 HOURS
ADMISSION, PROGRESSION, AND GRADUATION REQUIREMENTS, if applicable:

Progression requirements
Admission to the College of Education is required for participation in Apprentice Teaching and Seminar (UTCH 4101, 4601). Students unable to be admitted to UTCH 4601 and UTCH 4101 will be required to substitute advanced hours (3 hours for Secondary School concentration; 4 hours for Middle School concentration), as recommended by advisor.

Graduation requirements
1. The student must complete all these major course requirements and all MATH and MATE courses with grades of ‘C’ or better and have with a GPA for the major of 2.5 or better
2. In addition to the graduation requirements listed in the UTRGV 2015-2017 Undergraduate Catalog, demonstration of proficiency in a language other than English is required at the undergraduate level equivalent to a minimum of six credit hours. Proficiency can be demonstrated by a college credit exam, a placement test approved through the UTRGV Department of Writing and Language Studies, and/or up to six credit hours of college-level language coursework.