

# Grayson College Course Catalog

## Overview

### Program Description

To paraphrase Galileo, "Mathematics is the language in which the laws of nature are written" and the laws of society and economics as well. In recent years, applications of mathematics have expanded far beyond the traditional boundaries of physics, chemistry, and engineering. Biologists, sociologists, economists, psychologists, and even historians and lawyers have reached out to mathematicians in their quest for indisputable conclusions and novel methods of investigation. Thus, pure and applied mathematicians are and always will be in demand.

Grayson College offers an Associate of Science in Mathematics. This program opens the door to an attractive future for students who want to prepare for careers in fields requiring a solid background in quantitative analysis, transfer to university, or to teach mathematics at various levels.

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### Program Mission Statement

The Department of Mathematics seeks to ensure that all students are given a basic understanding of mathematical reasoning and some experience of its application. More advanced techniques and interpretative skills are taught to those whose chosen disciplines require them. The Mathematics Department offers courses of study that initiate students into the active practice and use of mathematics. Mathematics majors are provided with the background necessary to pursue careers in industry, to teach in the secondary schools, or to succeed in further study.

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### Program Philosophy

It is the belief of the Mathematics staff of Grayson College that mathematics is one of the fundamental skills of learning. The basics of mathematics, along with other essential communication skills, are ingredients that cannot be excluded from any student's formal training. We recognize qualitative literacy as being necessary for survival in a rapidly changing technological society. It is therefore agreed that despite the differences that exist in learning potential or individual student's achievement, there are certain common goals for all students in mathematics: the development of problem-solving and critical thinking skills; the facility to analyze data, make quantitative and qualitative comparisons, identify trends, and make valid conclusions and predictions; the capacity to make estimates and recognize reasonable results. We regard the skills of mathematics as part of being an educated person and critical to academic training and employment. Furthermore, we consider cooperation with the community, industry, and those in higher education essential in the development and delivery of a mathematics program which effectively educates our citizens and communicates the need for this education to all.

## AS Degree Requirements

### Associate of Science - Mathematics

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Subject	Semester Hours
<a href="#">ENGL 1301</a> (Composition I)	3
Mathematics Core	3
Creative Arts Core	3
Mathematics Elective	3
Language, Philosophy, & Cultural Core	3
Component Area Option Core	4
Communication Core	3
American History Core	3
American History Core	3
Social & Behavioral Sciences Core	3
<a href="#">Math 2414</a> (Calculus II)	4
Mathematics Elective	3
Life & Physical Sciences Core	3
Life & Physical Sciences Lab (CAO)	1
Government/Political Science Core	3

Academic Elective	1
Mathematics Elective	4
Mathematics Elective	3
Life & Physical Sciences Core	3
Life & Physical Sciences Lab (CAO)	1
Government/Political Science Core	3
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	<b>60</b>

Students are encouraged to select electives that meet the graduation requirement of the senior institution.

\*Please review your Student Planner or contact your Student Success Coach/Faculty Mentor to review which courses may be used to fill this degree requirement.

## Core

Students earning an Associate of Arts, Associate of Science, or Associate of Arts in Teaching Degree at Grayson College must complete 42 hours of a state mandated Core Curriculum in addition to major courses and electives in their particular area of interest. Following are the Core Curriculum Component Areas. [Click here](#) for allowable courses within each component area.

Component Areas	Required Hours
010 Communication	6
020 Mathematics	3
030 Life and Physical Sciences	6
040 Language, Philosophy, and Culture	3
050 Creative Arts	3
060 American History	6
070 Government/Political Science	6
080 Social and Behavioral Sciences	3
090 Component Area Option	6
<b>Total</b>	<b>42</b>

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### MATH 0120 - Mathematical Literacy Lab

This course is designed to supplement the concepts learned in MATH 1332 and MATH 1342.

**Grade Basis:** L

**Credit hours:** 1.0

**Lab hours:** 1.0

**Restrictions:**

- Must take with MATH 1332 or MATH 1342
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### MATH 0240 - Transition to College Algebra Lab

This course is designed to supplement the concepts learned in Math 1314

**Grade Basis:** L

**Lab hours:** 2.0

**Restrictions:**

- Concurrent enrollment in MATH 1314 is required.
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### MATH 0420 - Mathematical Literacy for College Students

The course supports students in developing skills, strategies, and reasoning needed to succeed in mathematics, including communication and appropriate use of technology. Topics include the study of numeracy and the real number system; algebraic concepts, notation, and reasoning; quantitative relationships; mathematical models; and problem solving.

**Grade Basis:** L  
**Credit hours:** 4.0  
**Lecture hours:** 4.0  
**Lab hours:** 1.0  
**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
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### **MATH 1314 - College Algebra**

In-depth study and applications of polynomial, rational, radical, exponential and logarithmic functions, and systems of equations using matrices. Additional topics such as sequences, series, probability, and conics may be included.

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0  
**Lab hours:** 1.0  
**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
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### **MATH 1316 - Plane Trigonometry**

In-depth study and applications of trigonometry including definitions, identities, inverse functions, solutions of equations, graphing, and solving triangles. Additional topics such as vectors, polar coordinates and parametric equations may be included.

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0  
**Prerequisites:**

- [MATH 1314](#) - College Algebra

**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
  - Two years of high school algebra or MATH 1314.
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### **MATH 1324 - Mathematics for Business and Social Sciences I**

The application of common algebraic functions, including polynomial, exponential, logarithmic, and rational, to problems in business, economics, and the social sciences are addresses. The application include mathematics of finance, including simple and compound interest and annuities; systems of linear equations; matrices; linear programming, and probability, including expected value.

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0  
**Restrictions:**

- Prerequisite: Meet TSI college-readiness standard for mathematics; or equivalent
  - A grade of C or better must be earned to progress to a math course that uses this course as a prerequisite.
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### **MATH 1325 - Mathematics for Business and Social Sciences II**

This course is the basic study of limits and continuity, differentiation, optimization and graphing, and integration of elementary functions, with emphasis on applications in business, economics, and social sciences. This course is not a substitute for MATH 2413 Calculus I.

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0  
**Prerequisites:**

- [MATH 1314](#) - College Algebra
  - [MATH 1324](#) - Mathematics for Business and Social Sciences I
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### **MATH 1332 - Quantitative Reasoning**

Intended for Non STEM (Science, Technology, Engineering, and Mathematics) majors. Topics include introductory treatments of sets and logic, financial mathematics, probability and statistics with appropriate applications. Number sense, proportional reasoning, estimation, technology, and communication should be embedded throughout the course. Additional topics may be covered

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0

**Restrictions:**

- Prerequisite: Meet TSI College-readiness standard for mathematics; or equivalent.
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### **MATH 1342 - Elementary Statistical Methods**

Collection, analysis, presentation and interpretation of data, and probability. Analysis includes descriptive statistics, correlation and regression, confidence intervals and hypothesis testing. Use of appropriate technology is recommended. (RM)

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0  
**Lab hours:** 1.0

**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
  - Prerequisites: Meet TSI College-readiness standard for mathematics; or equivalent.
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### **MATH 1350 - Mathematics for Teachers I**

This course is intended to build or reinforce a foundation in fundamental mathematics concepts and skills. It includes the conceptual development of the following: sets, functions, numeration systems, number theory, and properties of the various number systems with an emphasis on problem solving and critical thinking.

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0

**Prerequisites:**

- [MATH 1314](#) - College Algebra

**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
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### **MATH 1351 - Mathematics for Teachers II**

This course is intended to build or reinforce a foundation in fundamental mathematics concepts and skills. It includes the concepts of geometry, measurement, probability, and statistics with an emphasis on problem solving and critical thinking.

**Grade Basis:** ALP  
**Credit hours:** 3.0  
**Lecture hours:** 3.0

**Prerequisites:**

- [MATH 1314](#) - College Algebra

**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
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### **MATH 2305 - Discrete Mathematics**

A course 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, count ability and counting arguments, proof techniques, mathematical induction, combinatorics, discrete probability, recursion, sequence and recurrence, elementary number theory, graph theory, and mathematical proof techniques.

**Grade Basis:** ALP

**Credit hours:** 3.0

**Lecture hours:** 3.0

**Prerequisites:**

- [MATH 2413](#) - Calculus I
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### **MATH 2312 - Pre-Calculus Math**

In-depth combined study of algebra, trigonometry, and other topics for calculus readiness.

**Grade Basis:** ALP

**Credit hours:** 3.0

**Lecture hours:** 3.0

**Lab hours:** 1.0

**Prerequisites:**

- [MATH 1314](#) - College Algebra

**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
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### **MATH 2318 - Linear Algebra**

Introduces and provides models for application of the concepts of vector algebra. Topics include finite dimensional vector spaces and their geometric significance; representing and solving systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion; matrices; determinants; linear transformations; quadratic forms; eigenvalues and eigenvector; and applications in science and engineering.

**Grade Basis:** ALP

**Credit hours:** 3.0

**Lecture hours:** 3.0

**Prerequisites:**

- [MATH 2413](#) - Calculus I
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### **MATH 2320 - Differential Equations**

Ordinary differential equations, including linear equations, systems of equations, equations with variable coefficients, existence and uniqueness of solutions, series solutions, singular points, transform methods, and boundary value problems; application of differential equations to real-world problems.

**Grade Basis:** ALP

**Credit hours:** 3.0

**Lecture hours:** 3.0

**Lab hours:** 1.0

**Prerequisites:**

- [MATH 2414](#) - Calculus II
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## **MATH 2413 - Calculus I**

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 functions, with an application to calculation of areas.

**Grade Basis:** ALP

**Credit hours:** 4.0

**Lecture hours:** 4.0

**Prerequisites:**

- [MATH 2312](#) - Pre-Calculus Math

**Restrictions:**

- A grade of C or better must be earned to progress to a math course that uses this course as a prerequisite.
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## **MATH 2414 - Calculus II**

Differentiation and integration of transcendental functions; parametric equations and polar coordinates; techniques of integration; sequences and series; improper integrals

**Grade Basis:** ALP

**Credit hours:** 4.0

**Lecture hours:** 4.0

**Prerequisites:**

- [MATH 2413](#) - Calculus I

**Restrictions:**

- A grade of C or better must be earned to progress to a Math course that uses this course as a prerequisite.
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## **MATH 2415 - Calculus III**

Advanced topics in calculus, including vectors and vector-valued functions, partial differentiation, Lagrange multipliers, multiple integrals, and Jacobians; application of the line integral, including Green's Theorem, the Divergence Theorem, and Stokes' Theorem.

**Grade Basis:** ALP

**Credit hours:** 4.0

**Lecture hours:** 4.0

**Prerequisites:**

- [MATH 2414](#) - Calculus II
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## **PHED 1164 - Introduction to Physical Fitness & Sport**

Orientation to the field of physical fitness and sport. Includes the study and practice of activities and principles that promote physical fitness

**Grade Basis:** L

**Credit hours:** 1.0

**Lecture hours:** 3.0

**Restrictions:**

- One-hour physical education activity courses are not designed for transfer.
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## **COSC 1336 - Program Fundamentals I**

Introduces the fundamental concepts of structured programming. Topics include software development methodology, data types, control structures, functions, arrays, and the mechanics of running, testing, and debugging. This course assumes computer literacy.

**Grade Basis:** L  
**Credit hours:** 3.0  
**Lecture hours:** 3.0  
**Lab hours:** 1.0

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