

Grayson College Course Catalog

Overview

For students planning to pursue a Engineering major and transfer to a four-year institution, as a general rule, students should follow the **Associate of Science Degree in Engineering** at Grayson College as part of the **Science and Technology Career Pathway**. All students are advised to counsel with the university/college of their choice to determine which courses offered at Grayson College are applicable to that institution's bachelor's degree in their desired major.

AS Degree Requirements

Associate of Science - Engineering

*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.

Subject	Semester Hours
Mathematics Core	3
Life & Physical Science Core	3
Life & Physical Science Lab (CAO)	1
ENGL 1301 (Composition I)	3
American History Core	3
Engineering Elective	2
Life & Physical Science Core	3
Life & Physical Science Lab	1
Component Area Option Core	4
Communication Core	3
American History Core	3
Engineering Elective	3
Engineering Elective	3
Engineering Elective	3
Government/Political Science Core	3
Social & Behavioral Sciences Core	3
Engineering Elective	3
Engineering Elective	3
Government/Political Science Core	3
Creative Arts Core	3
Language, Philosophy, & Cultural Core	3
	60

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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
Total	42

ENGR 2105 - Electrical Circuits 1 Lab

Laboratory experiments supporting theoretical principles presented in ENGR 2305 involving DC and AC circuit theory, network theorems, time, and frequency domain circuit analysis. Introduction to principles and operation of basic laboratory equipment; laboratory report preparation. Co-requisite: ENGR 2305

Grade Basis: L

Credit hours: 1.0

Lab hours: 3.0

Restrictions:

- Concurrent Enrollment in MATH 2305

ENGR 2305 - Electrical Circuits I

Principles of electrical circuits and systems. Basic circuit elements resistance, inductance, mutual inductance, capacitance, independent and dependent controlled voltage, and current sources. Topology of electrical networks; Kirchhoff's laws; node and mesh analysis; DC circuit analysis; operational amplifiers; transient and sinusoidal steady-state analysis; AC circuit analysis; first- and second-order circuits; Bode plots; and use of computer simulation software to solve circuit problems.

Grade Basis: L

Credit hours: 3.0

Lecture hours: 3.0

Restrictions:

- Concurrent enrollment in MATH 2320 required.
- Pre-Requisites MATH 2414, PHYS 2315, and PHYS 2115.

ENGR 1201 - Introduction to Engineering

This is an introduction to the engineering profession with emphasis on technical communication and team-based engineering design.

Grade Basis: L

Credit hours: 2.0

Lecture hours: 1.0

Lab hours: 3.0

Prerequisites:

- [MATH 1314](#) - College Algebra

ENGR 1304 - Engineering Graphics I

Introduction to computer-aided drafting using CAD software and sketching to generate two- and three-dimensional drawings based on the conventions of engineering graphical communication; topics include spatial relationships, multi-view projections and sectioning, dimensioning, graphical presentation of data, and fundamentals of computer graphics.

Grade Basis: L

Credit hours: 3.0

Lecture hours: 3.0

Lab hours: 4.0

Prerequisites:

- [MATH 1314](#) - College Algebra

ENGR 2301 - Engineering Mechanics – Statics

Basic theory of engineering mechanics, using calculus, involving the description of forces, moments, and couples acting on stationary engineering structures; equilibrium in two and three dimensions; free-body diagrams; friction; centroids; centers of gravity; and moments of inertia.

Grade Basis: L

Credit hours: 3.0

Lecture hours: 3.0

Prerequisites:

- [PHYS 2125](#) - University Physics Laboratory I
- [PHYS 2325](#) - University Physics I

Restrictions:

- Concurrent enrollment in MATH 2414 (Calculus II)
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ENGR 2302 - Engineering Mechanics - Dynamics

Basic theory of engineering mechanics, using calculus, involving the motion of particles, rigid bodies, and systems of particles; Newton's Laws; work and energy relationships; principles of impulse and momentum; application of kinetics and kinematics to the solution of engineering problems.

Grade Basis: L

Credit hours: 3.0

Lecture hours: 3.0

Prerequisites:

- [ENGR 2301](#) - Engineering Mechanics – Statics
-

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

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
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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
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ENGR 2332 - Mechanics of Materials

Stresses, deformations, stress-strain relationships, torsions, beams, shafts, columns, elastic deflections in beams, combined loading, and combined stresses.

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

Prerequisites:

- [ENGR 2301](#) - Engineering Mechanics – Statics
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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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