

# Early-Entry Pathway

Welcome to North Dakota State University's Early-Entry Pathways program.

## MECHANICAL ENGINEERING

If you are interested in a degree in mechanical engineering, you can take early-entry courses to get started on this degree. Early-entry courses listed meet the requirements or electives of this major. These courses may be used to meet your general education requirements as well. We suggest you also review the list of recommended general education courses.

### Calculus I

MATH 165 | 4 credits  
General Education Category: R

Limits, continuity, differentiation, Mean Value Theorem, integration, Fundamental Theorem of Calculus and applications. Prereq: MATH 105, MATH 107 or placement.

### College Composition I

ENGL 110 | 3 credits  
General Education Category: C

Guided practice in the reading and writing of various genres for different situations and audiences. Includes research on the web and in the library. Prereq: English placement.

### General Chemistry I

CHEM 121 | 3 credits  
General Education Category: S

Matter, measurement, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, and gases. Prereq or Co-req: MATH 103, MATH 107 or Math placement.

### Intro To Mechanical Engineering

ME 111 | 2 credits  
General Education Category: Does not meet NDSU's general education requirements.

This course introduces students to the field of mechanical engineering, the Mechanical Engineering degree program at NDSU, and potential career opportunities in the discipline through the use of hands-on, project-based learning experiences in multi-member teams addressing traditional and newly emerging topics in the field of mechanical engineering, including computer aided design, solid mechanics, fluid dynamics, thermodynamics, materials selection, instrumentation and data analysis in the context of problem-solving and design. Prereq: Acceptance into the Pre-Mechanical Engineering major.

### Calculus II

MATH 166 | 4 credits  
General Education Category: Does not meet NDSU's general education requirements.

Applications and techniques of integration; polar equations; parametric equation; sequences and series, power series. Prereq: MATH 165.

### College Composition II

ENGL 120 | 3 credits  
General Education Category: C

Advanced practice in reading and writing of various genres for different situations and audiences. Includes field research, collaboration, and visual communication. Prereq: ENGL 110 or placement.

### General Chemistry II

CHEM 122 | 3 credits  
General Education Category: S

Intermolecular forces, liquids, solids, kinetics, equilibria, acids and bases, solution chemistry, precipitation, thermodynamics, and electrochemistry. Prereq: CHEM 121.

### Fundamentals of Visual Communication For Engineers

ME 212 | 3 credits  
General Education Category: Does not meet NDSU's general education requirements.

Visual communications for design and manufacturing, computer-aided drawing and design, three-dimensional modeling and orthographic projections, geometric dimensioning and tolerancing, ASME Y14.5 1994 standard, sketching, parametric modeling, drawings and assemblies.

### Engineering Mechanics I

ME 221 | 3 credits  
General Education Category: Does not meet NDSU's general education requirements.

Scalar and vector approaches to trusses, frames and machines, internal forces, friction forces, center of gravity, centroid, and moment inertia. Prereq: MATH 165.

View all pathway guides & a general education guide at >>  
[bit.ly/EE\\_pathways\\_guides](https://bit.ly/EE_pathways_guides).

## Basic Linear Algebra

MATH 129 | 3 credits  
General Education Category: Does not meet NDSU's general education requirements.

Systems of linear equations, matrices, determinants, vector spaces, lines and planes in space, linear transformations, eigenvalues and eigenvectors. Credit awarded only for MATH 128 or MATH 129, not both. Prereq: MATH 105 or MATH 107.

## Multivariate Calculus

MATH 259 | 3 Credits  
General Education Category: Does not meet NDSU's general education requirements.

Functions of several variables, vectors in two and three variables, partial derivatives, surfaces and gradients; tangent planes, differentials, chain rule, optimization, space curves, and multiple integrals. Prereq: MATH 166. Credit awarded only for MATH 259 or MATH 265, not both.

## Engineering Mechanics II

ME 222 | 3 credits  
General Education Category: Does not meet NDSU's general education requirements.

Dynamics of particles and rigid bodies, work energy, impulse-momentum, principles of conservation of energy and momentum. Prereq: ME 221, MATH 166.

## Mechanics of Materials

ME 223 | 3 credits  
General Education Category: Does not meet NDSU's general education requirements.

Introduction to stress, strain, and their relationships; torsion of circular shafts, bending stresses, deflection of beams, stress transformations. Prereq: ME 221.

# Introduction to Differential Equations

MATH 266 | 3 credits  
General Education Category: Does not meet NDSU's general education requirements.

Solution of elementary differential equations by elementary techniques. Laplace transforms, systems of equations, matrix methods, numerical techniques, and applications.

## Fundamentals of Public Speaking

COMM 110 | 3 credits  
General Education Category: C

Theory and practice of public speaking with emphasis on content, organization, language, delivery, and critical evaluation of messages.

## University Physics II

PHYS 252 | 4 credits  
General Education Category: Does not meet NDSU's general education requirements.

Electric charge, field, potential, and current; magnetic field; capacitance; resistance; inductance; RC, RL, LC and RLC circuits; waves; optics.

## NOTES

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