Nebraska Wesleyan University

Mathematics and Computer Science

Catalog

2025-2026

Majors, Minors & Degrees

Majors

1. Data Analytics (B.A., B.S.)
2. Mathematics (B.A., B.S.)

Minors

1. Computer Science
2. Data Analytics
3. Mathematics

Courses

CMPSC 1900 Selected Topics

1-4 hours

A topical course designed to investigate relevant subject matter not included in any standard courses. The title and the content will be determined by current mutual interests of students and faculty. This course may be offered to meet a requirement for a major only by approval of the department chair.

CMPSC 1950 Independent Study

1-4 hours

This is a research course. The student initially meets with the department chair to select a study topic and review research methods. At this time the student will be assigned a faculty resource person to guide his or her work and assist in an advisory capacity. A copy of the student's work is filed in the archives for the department. Independent study may not duplicate courses described in the catalog. Prerequisite(s): Permission of the department chair.

CMPSC 1970 Internship

1-8 hours

On-the-job training in computer science in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department. Pass/Fail only. Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Exploratory

CMPSC 2200 Python Programming I

4 hours

An introduction to computational problem-solving using Python. Hands-on labs are used to motivate basic programming concepts, including basic data types and structures, functions, conditionals, and loops. Additional topics may include building and scraping HTML webpages. The course is recommended for all who wish to explore data science and/or computer science. Recommended: Math ACT score of at least 21 or instructor permission of a prerequisite waiver.

(Normally offered every spring semester.)

Archway Curriculum: Foundational Literacies: Mathematical Problem Solving

CMPSC 2600 Computer Architecture and Interfacing

4 hours

See PHYS 2600 Computer Architecture and Interfacing.

CMPSC 2970 Internship

1-8 hours

On-the-job training in computer science in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department. Pass/Fail only. Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Intensive

CMPSC 3000 Data Structures

3 hours

This course, built in collaboration with Google, will teach you how to understand and use data structures. Data structures are used by almost every program and application to store, access and modify the vast quantities of data that are needed by modern software. By the end of this course you'll learn what data structures are and learn how to use them in the applications you build. This online class has optional live sessions. This course is an online class offered through the Lower Cost Models Consortium. The class has optional live sessions. *Prerequisite(s): CMPSC 3200 Python Programming II.*

CMPSC 3200 Python Programming II

4 hours

A project-based continuation of the techniques developed in CMPSC 2200 Python Programming I. Topics include object-oriented programming, algorithm design and analysis, data structures, and general problem-solving techniques (such as recursion) while following industry-standard software development principles. Prerequisite(s): Grade of "C" or better in CMPSC-2200 or instructor permission of a prerequisite waiver.

(Normally offered every fall semester.)

CMPSC 3960 Special Projects

1-15 hours

Supervised individual projects for students on topics selected by the student in consultation with the instructor. Special Projects may not duplicate courses described in the catalog.
Prerequisite(s): Permission of the instructor.

CMPSC 3970 Internship

1-8 hours

On-the-job training in computer science in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department.
Pass/Fail only.

Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Intensive

CMPSC 4000 Algorithms

3 hours

This course explores algorithms from a coding-focused perspective, using Python. Students will learn about the issues that arise in the design of algorithms for solving computational problems and will explore a number of standard algorithm design paradigms and their applicability. Students will also become familiar with concepts of runtime, recursion, implementation and evaluation. This course features a heavy emphasis on practical application of algorithms to common development and engineering challenges. This course is an online class offered through the Lower Cost Models Consortium. The class has optional live sessions.

Prerequisite(s): CMPSC 3000 Data Structures and MATH 1600 Calculus I.

CMPSC 4960 Special Projects

1-15 hours

Supervised individual projects for students on topics selected by the student in consultation with the instructor. Special Projects may not duplicate courses described in the catalog. Prerequisite(s): Permission of the instructor.

CMPSC 4970 Internship

1-8 hours

On-the-job training in computer science in situations that satisfy the mutual interests of the student, the supervisor, and the instructor.
P/F only.
Prerequisite(s): Permission of the Program Director and junior or senior standing.

Archway Curriculum: Essential Connections: Experiential Learning: Intensive

DATA 1200 Excel and SQL Programming

4 hours

A study of managing, manipulating, and summarizing data using Excel and SQL. Topics in Excel include, but are not limited to: functions, filters, charts and visualizations, pivot tables, and macros. Topics in SQL include, but are not limited to: queries, joins, and basic database management.

(Normally offered every spring semester.)

Archway Curriculum: Foundational Literacies: Mathematical Problem Solving

DATA 1350 Introduction To Data Analytics

4 hours

An introduction to data analytics from three perspectives: inferential thinking, computational thinking and real-world relevance. Topics include, but are not limited to: organizing real-world data by filtering, sorting, and using pivot tables; exploring data; visualizing data; using programming tools to analyze data through a statistical lens. Statistical topics include: center and spread of data, descriptive statistics, inferential statistics, regression, causality, classification and prediction.

(Normally offered every fall semester.)

Archway Curriculum: Foundational Literacies: Mathematical Problem Solving

DATA 1970 Internship

0 hours

On-the-job training in data analytics in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department. Pass/Fail only.

Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Exploratory

DATA 2200 Forecasting And Logistics

3 hours

Supply chain management is the process by which organizations get us the products we consume, and companies need talented employees to help optimize their supply chain. This course will teach you how to use forecasting techniques to match supply and demand, and how to develop logistics networks that help minimize costs and deliver top customer service. This online class has optional live sessions. This course is an online class offered through the Lower Cost Models Consortium. The class has optional live sessions.

DATA 2300 Sourcing and Operations

3 hours

In today's modern economy, something as simple as a razor might be manufactured in multiple countries with each part coming from a different supplier. This course will teach you how businesses manage this increasing complexity behind the scenes through efficient sourcing of suppliers and operations. You will have the opportunity to apply this knowledge by conducting a real-world case study of a product of your choosing. This course is an online class offered through the Lower Cost Models Consortium. The class has optional live sessions.

Prerequisite(s): DATA 2200 Forecasting And Logistics.

DATA 2970 Internship

1-8 hours

On-the-job training in data analytics in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department. Pass/Fail only.

Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Intensive

DATA 3100 Data Visualization With R

4 hours

A study of data visualization, including principles and techniques. Students will analyze the effectiveness of visualizations, create a wide array of visualizations using the programming language R, and communicate a story through them. Significant emphasis will be placed on getting and cleaning data.

Prerequisite(s): Grade of "C" or better in CMPSC 2200 Python Programming I and grade of "C" or better in MATH 1300 Statistics .

(Normally offered every spring semester.)

DATA 3200 Principles and Techniques of Data Analytics I

3 hours

This course explores key principles and techniques of data science in Python, including programming foundations, data management, advanced data visualization, integration with SQL, and machine learning. This course is an online class offered through the Lower Cost Models Consortium. The class has optional live sessions.

Prerequisite(s): CMPSC 3200 Python Programming II and DATA 1350 Introduction To Data Analytics.

DATA 3300 Principles and Techniques of Data Analytics II

3 hours

This course builds on DATA 3200 by exploring key principles and techniques in time series analysis and forecasting, advanced regression, unsupervised and deep learning, feature engineering, and ethical issues. This course is an online class offered through the Lower Cost Models Consortium.

Prerequisite(s): DATA 3200 Principles and Techniques of Data Analytics I and MATH 1600 Calculus I.

DATA 3970 Internship

1-8 hours

On-the-job training in data analytics in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department. Pass/Fail only.

Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Intensive

DATA 4970 Internship

1-8 hours

On-the-job training in data analytics in situations that satisfy the mutual interests of the student, the supervisor, and the instructor. The student will arrange for the position in accordance with the guidelines established by the department. Pass/Fail only.

Prerequisite(s): Permission of the instructor and approval of the department chair.

Archway Curriculum: Essential Connections: Experiential Learning: Intensive

DATA 4980 Capstone Project

3 hours

A student-driven collaborative project synthesizing skills developed in the data analytics major.

Prerequisite(s): At least Junior standing and grades of "C" or better in CMPSC 3200 Python Programming II and DATA 3100 Data Visualization With R.

(Normally offered every spring semester.)

Archway Curriculum: Essential Connections: Discourse Instructive
Archway Curriculum: Essential Connections: Experiential Learning: Intensive

MATH 1010 Mathematics and Democracy

3 hours

A study of various aspects of mathematics pertinent to a democracy including voting methods, logic of argumentation, statistics in the media, and financial mathematics.
(Normally offered each spring semester.)

MATH 1100 College Algebra

3 hours

A study of functions from algebraic, graphical, numerical and modeling perspectives. The functions are chosen from among linear, polynomial, rational, exponential and logarithmic.
Prerequisite(s): Math ACT score of at least 21.
(Normally offered each semester.)

MATH 1200 Mathematics for Elementary Teachers

3 hours

A course for elementary education majors designed to promote a deep understanding of elementary mathematics topics, including the decimal system, fractions, percentages, arithmetic operations and problem-solving. Emphasis is placed on communicating mathematics, both in writing and orally.
(Normally offered each fall semester.)

MATH 1300 Statistics

3 hours

An introduction to statistics concepts with an emphasis on applications. Topics include descriptive statistics, discrete and continuous probability distributions, the central limit theorem, confidence intervals, hypothesis testing, and linear regression.
(Normally offered every semester.)

MATH 1470 Trigonometry

2 hours

A study of trigonometric functions, identities, equations, and their applications.
Prerequisite(s): Math ACT score of at least 24 or a grade of "C" or better in MATH 1100 College Algebra.
MATH 1100 College Algebra and MATH 1470 Trigonometry may be taken concurrently with the permission of the Trigonometry instructor or department chair.
(Normally offered during the last 8 weeks of each semester in an online format.)

MATH 1600 Calculus I

5 hours

An introduction to calculus of a single variable. Topics include limits, continuity, differentiation, and beginning integration with applications. Assignments are given that help build proficiency in the use of a computer algebra system.
Prerequisite(s): Math ACT score of at least 27, or a grade of "C" or better in MATH 1470 Trigonometry or MATH-1400, or permission of the instructor.
(Normally offered each semester.)

MATH 1610 Calculus II

5 hours

A continuation of MATH 1600 Calculus I. Topics studied include integration techniques and applications, differential equations, numerical approximations, sequences and series, and vectors. Assignments are given that help build proficiency in the use of a computer algebra system.
Prerequisite(s): Permission of the department chair or grade of "C" or better in MATH 1600 Calculus I.
(Normally offered each semester.)

MATH 1950 Independent Study

1-4 hours

This is a course where a student works independently on a topic. The student initially meets with the department chair to select a study topic. At this time the student will be assigned a faculty resource person to guide his or her work and assist in an advisory capacity. A copy of the student's work is filed in the archives for the department. Independent Study may not duplicate courses described in the catalog.
Prerequisite(s): Permission of the department chair.

MATH 1970 Internship

0-8 hours

An on-the-job experience oriented toward the student's major interest. The student is to secure a position in an organization that satisfies the mutual interests of the instructor, the sponsor, and the student. P/F Only.
Prerequisite(s): Permission of the department chair.

MATH 2200 Foundations of Modern Mathematics

3 hours

This course develops some of the most fundamental ideas and techniques underpinning all of mathematics. We will investigate questions such as: What is the structure of deductive logic? How do mathematicians ascertain and communicate truth? How are numbers and infinities constructed? Are there limits to mathematical understanding? Emphasis will be placed on strengthening the ability to write clear, precise arguments in the context of mathematical foundations (logic, numbers, sets, functions, etc.). This course is open to students from all majors and requires no specific mathematics background.

Prerequisite(s): MATH 1100 College Algebra or MATH 1300 Statistics or MATH 1600 Calculus I or permission of the instructor.

(Normally offered each spring semester.)

MATH 2600 Calculus III

4 hours

An introduction to multivariable calculus. Topics include vector-valued functions, functions of several variables, partial derivatives, multiple integrals, and analysis. Assignments are given that help build proficiency in the use of a computer algebra system.
Prerequisite(s): Permission of department chair or grade of "C" or better in MATH 1610 Calculus II.
(Normally offered each fall semester.)

MATH 2700 Tutoring Experience

0 hours

A tutoring experience comprised of at least 20 hours of mathematics tutoring. Tutoring may include, but is not limited to, these types: volunteer tutoring, tutoring at NWU's Math Tutoring Center or private tutoring. A reflection component is required.
Prerequisite(s): Permission of Department Chair.
Pass/Fail Only.

MATH 2950 Independent Study

1-4 hours

This is a course where a student works independently on a topic. The student initially meets with the department chair to select a study topic. At this time the student will be assigned a faculty resource person to guide his or her work and assist in an advisory capacity. A copy of the student's work is filed in the archives for the department. Independent Study may not duplicate courses described in the catalog.
Prerequisite(s): Sophomore standing and permission of the department chair.

MATH 2970 Internship

1-8 hours

An on-the-job experience oriented toward the student's major interest. The student is to secure a position in an organization that satisfies the mutual interests of the instructor, the sponsor, and the student. P/F Only.
Prerequisite(s): Permission of the department chair.

MATH 3100 Differential Equations

4 hours

A study of ordinary differential equations. Topics include first- and higher-order, linear and nonlinear differential equations with applications. Additional topics may be chosen from systems of differential equations, transform techniques, and numerical methods. Use will be made of a computer algebra system.
Prerequisite(s): Grade of "C" or better in MATH 1610 Calculus II.
(Normally offered each spring semester.)

MATH 3200 Linear Algebra

3 hours

A study of vector spaces, determinants, linear transformations, matrices, matrix equations, and their applications in the natural and social sciences.
Prerequisite(s): Grade of "C" or better in MATH 1610 Calculus II.
(Normally offered each spring semester.)

MATH 3300 Mathematical Statistics I

3 hours

An introduction to basic probability and statistics concepts with an emphasis on applications. Topics include descriptive statistics, probability, Bayes' Theorem, discrete and continuous probability distributions, joint probability distributions, estimation and hypothesis testing.
Prerequisite(s): Grade of "C" or better in MATH 1610 Calculus II.
(Normally offered fall of even-numbered years.)

MATH 3500 Geometry

3 hours

Selected topics from Euclidean and non-Euclidean geometry, geometry as a mathematical structure, and geometry as a study of invariants of set transformations.
Prerequisite(s): Grade of "C" or better in MATH 2200 Foundations of Modern Mathematics.
(Normally offered fall of odd-numbered years.)

MATH 3950 Independent Study

1-4 hours

This is a course where a student works independently on a topic. The student initially meets with the department chair to select a study topic. At this time the student will be assigned a faculty resource person to guide his or her work and assist in an advisory capacity. A copy of the student's work is filed in the archives for the department. Independent Study may not duplicate courses described in the catalog.
Prerequisite(s): Junior standing or permission of the department chair.

MATH 3970 Internship

1-8 hours

An on-the-job experience oriented toward the student’s major interest. The student is to secure a position in an organization that satisfies the mutual interests of the instructor, the sponsor, and the student. P/F Only.
Prerequisite(s): Permission of the department chair.

MATH 4200 Abstract Algebra I

4 hours

A study of various algebraic systems arising in modern mathematics, such as groups and rings.
Prerequisite(s): Grade of "C" or better in MATH 2200 Foundations of Modern Mathematics.
(Normally offered fall of even-numbered years.)

MATH 4300 Real Analysis

4 hours

A formal approach to limits, continuity, differentiation, and integration with emphasis on the proofs of theorems. Additional topics may include topology, uniform continuity, and uniform convergence.
Prerequisite(s): Grade of "C" or better in MATH 2200 Foundations of Modern Mathematics and MATH 1610 Calculus II.
(Normally offered spring of even-numbered years.)

MATH 4800 Research Experience

0-3 hours

A guided, original research experience on a mathematical topic. This course will culminate in a conference-style presentation and written report. Students will keep a reflection journal throughout the experience.

Prerequisite(s): Instructor permission.

MATH 4950 Independent Study

1-4 hours

This is a course where a student works independently on a topic. The student initially meets with the department chair to select a study topic. At this time the student will be assigned a faculty resource person to guide his or her work and assist in an advisory capacity. A copy of the student's work is filed in the archives for the department. Independent Study may not duplicate courses described in the catalog.
Prerequisite(s): Senior standing or permission of the department chair.

MATH 4970 Internship

1-8 hours

An on-the-job experience oriented toward the student’s major interest. The student is to secure a position in an organization that satisfies the mutual interests of the instructor, the sponsor, and the student. P/F Only.
Prerequisite(s): Permission of the department chair.

MATH 4980 Mathematics Seminar

3 hours

A study of topics of special interest in mathematics. Students begin the course by studying an advanced topic in mathematics. Students then work on individualized projects culminating in a symposium presentation and survey paper.
Prerequisite(s): Major in mathematics, senior standing, grade of "C" or better in either MATH 4200 Abstract Algebra I or MATH 4300 Real Analysis, and permission of the instructor.
(Normally offered fall semester of odd years.)