

Approved Electives for CE

Updated: March 20, 2018

MST Electives

Mathematics Electives

MATH 2250 Elementary Linear Algebra (3)
MATH 2300 Discrete Structures (3)
MATH 3310 Applied Differential Equations II (3)
MATH 3340 Introduction to Scientific Computing (3)
MATH 3500 Algebra I: Introduction to Rings and Proofs (3)
MATH 4230 Introduction to Complex Analysis (3)
MATH 4255 Mathematical Theory of Probability (cross-listed with STAT 4255) (3)
MATH 4300 Introduction to Mathematical Modeling (3)
MATH 4340 Numerical Analysis (3)
MATH 4400 Topics in Applied Math (3)
MATH 4440 Partial Differential Equations I (3)
MATH 4500 Matrix Theory (3)
MATH 5310 Computational Methods in Applied Sciences I (3)
STAT 3050 Statistical Methods - General
STAT 4015 Regression Analysis (3)
STAT 4025 Design and Analysis of Experiments I (3)
STAT 4115 Time Series Analysis and Forecasting (3)
STAT 4155 Fundamentals of Sampling (3)
STAT 4265 Introduction to the Theory of Statistics (cross-listed with MATH 4265) (3)

Science Electives

ASTR 2310 General Astronomy (4)
ATSC 2000 Introduction to Meteorology (3)
ATSC 2100 Global Warming: The Science of Humankind's Energy Consumption Impacting Climate (3)
ATSC 4010 Atmospheric Processes I (3)
ATSC 4320 The Ocean Environment (3)
LIFE 1010 General Biology (4)
 Plus all Biology, Botany, and Zoology courses that have LIFE 1010 as a prerequisite.
CHEM 1030 General Chemistry II (4)
CHEM 1060 Advanced General Chemistry II (4)
 Plus all Chemistry courses that have CHEM 1020, 1030, 1050, or 1060 as a prerequisite.
ENR 1200 Environment (4)
GEOL 1100 Physical Geology (4)
GEOL 1110 Physical Geology for Engineers (4)
GEOL 1500 Water, Dirt, and Earth's Environment (4)
GEOL 1600 Global Sustainability (4)
GEOL 2000 Geochemical Cycles and the Earth (4)
GEOL 3600 Earth and Mineral Resources (4)
GEOL 4113 Geological Remote Sensing (3)

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GEOL 4444 Geohydrology (3)

Plus all Geology courses that have GEOL 1100 as a prerequisite.

MOLB 2021 General Microbiology (4)

Plus all Molecular Biology courses that have MOLB 2021 as a prerequisite.

PHYS 1210 Engineering Physics I (4)

PHYS 1220 Engineering Physics II (4)

PHYS 2310 Physics III: Waves and Optics (3)

Plus all Physics courses that have PHYS 1210 or 1310 as a prerequisite.

AECL 2010 Introduction to Soil Science (4)

AECL 3030 Ecology of Plant Protection (3)

SOIL 2010 Introduction to Soil Science (4)

SOIL 3130 Environmental Quality (3)

SOIL 4100 Soil Physics (4)

SOIL 4130 Chemistry of the Soil Environment (4)

Technical Electives

ARE 1600 Architectural Design Studio I (freshmen and sophomores only)

ARE 2410 Fundamentals of Building Performance

ARE 2600 Architectural Design Studio II

ARE 3030 Architectural History

ARE 3300 Building Electrical and Plumbing

ARE 3360 Fundamentals of Transport Phenomena

ARE 3400 Heating, Ventilating and Air Conditioning of Buildings

ARE 3600 Architectural Design Studio III

CE 4100 Civil Engineering Applications in GIS

CE 4430 Environmental Engineering Chemistry

CE 4610/5610 Instrumentation in Civil Engineering

CE 4970 WYDOT Design Squad Cooperative Experience* (see p.5)

CE 4965 Undergraduate Research

CE 4975 Civil and Architectural Engineering Internship

CHE 2005 Chemical Process Analysis

CHE 2060 Intro to Chemical Engineering Computing

CHE 3015 Multicomponent Thermodynamics

CHE 3025 Transport Phenomena

CHE 4000 Environment, Technology and Society

CM 2000 – Intro to Construction Management

CM 3100 – Construction Scheduling

CM 3120 – Construction Cost Estimating

COJO 3010 Business and Professional Communication

COSC 1030 Computer Science I

COSC 2150 Computer Organization

COSC 2300 Discrete Structures

DSCI 3210 Introduction to Operations and Supply Chain Management

DSCI 4230 Purchasing and Supply Management

DSCI 4240 Computer Applications in Decision Sciences

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DSCI 4250 Revenue Management
DSCI 4260 Project Management
EE 3150 Electromagnetics
EE 3310 Electronics I
EE 3510 Electromechanics
EE 4510 Power Systems
ENR 1300 Foundations of Sustainability
ENR 2000 Environment and Society
ENR 2330 Environmental Ethics
ENR 2345 Natural Resource Ethics
ENR 3000 Approaches to ENR Problem Solving
ENR 3900 ENR Seminar
ENR 4500 Risk Analyses and Management
ENR 4900 ENR Policy in Practice
ES 2210 Electric Circuit Analysis
FIN 3250 Corporate Finance
FIN 4610 Real Estate and Urban Economics
LAW 6860 Water Rights
LS XXXX Any class in the Land Surveying program
ME 3005 Engineering Experimentation
ME 3010 Intermediate Mechanics of Materials
ME 3020 System Dynamics
ME 3040 Thermodynamics II
ME 3060 Numerical Methods for Engineers
ME 3160 Thermal/Fluid Science Lab
ME 3360 Fundamentals of Transport Phenomena
ME 4010 Mechanical Vibrations
ME 4020 Design of Mechanical/Electronic Systems
ME 5440 Fluid Mechanics
MGT 1040 Legal Environment of Business
MGT 2000 Introduction to Business
MGT 3110 Business Ethics
MGT 3210 Management and Organization
PETE 2050 Fundamentals of Petroleum Engineering
PETE 2060 Introduction to Petroleum Engineering Computing

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Professional Development Elective (PDE) Guidelines

18 hours of structured Professional Development Electives (PDE) are required.

A CDE activity must be included in those 18 hours.

One Structural PDE is required.

Electives are to be selected from at least three (3) areas of emphasis.

Areas of Emphasis within the Civil Engineering Program:

1. Environmental Engineering
2. Geotechnical Engineering
3. Structural Engineering
4. Transportation Engineering
5. Water Resources Engineering

Professional Development Elective (PDE) Courses

Environmental Engineering

CE 4400 Design of Water Treatment Facilities
CE 4410 Design of Wastewater Treatment Facilities
CE/CHE/ENR 4430 Green Chem. & Global Env. Prob.
CE/ENVE 4441 Solid Waste Engineering
CE/CHE 54XX Water Reuse (class has not yet been created)
CE 5400 Advanced Water Treatment
CE/CHE 5410 Advanced Biological Wastewater Treatment
ENVE 5430 Environmental Engineering Chemistry
CE 5435 Environmental Transport Processes
CE 5445 Hazardous Waste Site Remediation
CE 5450 Advanced Physical-Chemical Treatment

Geotechnical Engineering

CE 4610/5610 Foundation Engineering
CE 4620/5660 Soil and Rock Slope Engineering
CE 4630/5630 Ground Improvement, Reinforcement and Treatment
CE 5640 Geotechnical Earthquake Engineering

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Structural Engineering

One of the following is required:

- CE 4250 Structural Steel Design (fall only)
- CE 4260 Structural Concrete Design (spring only)

Beyond the above, any of the following

- CE 4200 Structural Analysis II (fall only)
- CE 4265/5265 Prestressed Concrete Design
- CE 4285/5285 Reinforced Masonry Design
- CE 4295/5295 Structural Timber Design
- CE 5010 Advanced Mechanics of Materials
- CE 5200 Advanced Structural Analysis
- CE 5220 Structural Dynamics
- CE 5255 Advanced Steel
- CE 5270 Highway Bridge Design
- CE 5280 Behavior of Reinforced Concrete
- CE 5290 Earthquake Engineering

Transportation Engineering

- CE 4510/5510 Pavement Design for Airports and Highways
- CE 4530/5530 Traffic Engineering: Operations
- CE 4555/5555 Geometric Design of Highways
- CE 5700 Traffic Simulation
- CE 4970 WYDOT Design Squad Cooperative Experience*
- CE 5540 Traffic Control
- CE 5560 Traffic Safety
- CE 5570 Transportation Planning
- CE 5575 Intelligent Transportation Systems
- CE 5585 Pavement Management Systems
- CE 5590 Pavement Materials
- CE 5700 Public Transportation
- CE 5700 Traffic Flow

Water Resources Engineering

- CE 4800 Hydrology (every 3rd semester)
- CE 4810/5810 Groundwater Hydrology
- CE 4870/5870 Water Resources Engineering
- CE 5300 Open Channel Hydraulics
- CE 5321 Engineering and Environment Geophysics
- CE 5700 Groundwater contamination transport CE 5830 Flow in Porous Media
- CE 5850 Advanced Subsurface Hydrology
- CE 5865 Deterministic Hydrology CE 5875 Probabilistic Hydrology
- CE 5880 Advanced Hydrology
- CE 5885 Hydrometeorology

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Comprehensive Design Experience (CDE) Courses

CE 4900 Comprehensive Design Experience (spring only)