

Civil Engineering (CE) Elective list

Updated: January 18, 2024

Professional Development Elective (PDE) Courses

Must take 5 courses (15 hours min.)

One Structural PDE is required (4250 or 4260)

PDEs must cover at least 3 areas of emphasis (Structural plus 2)

Transfer credit for these courses is generally not accepted

Students must take **two of the approved PDE Design courses as prerequisites to the Capstone (CE 4900)*

Structural courses

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 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

Environmental courses

*CE 4400 Design of Water Treatment Facilities

*CE 4410 Design of Wastewater Treatment Facilities

CE 4430 Green Chemistry and Global Env. Problems

CE 4441 Solid Waste Engineering

CE 4470/5470 Water for Energy

CE 4480/5480 Carbon Capture and Storage

CE 5400 Water Treatment

CE 5410 Advanced Biological Wastewater Treatment

CE 5425 Environmental Engineering Microbiology

CE 5430 Environmental Engineering Chemistry

CE 5435 Environmental Transport Processes

CE 5445 Hazardous Waste Site Remediation

CE 5450 Advanced Physical-Chemical Treatment

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Geotechnical courses

*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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Professional Development Elective (PDE) Courses (cont.)

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 4565 Traffic Simulation CE 4970 WYDOT Design Squad Coop** 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
<i>**CE 4970 WYDOT Design Squad may be used for PDE if taken along with CE 4510/5510, CE4530/5530 or CE 4555/5555</i>

Water Resources Engineering
CE 4650 Hydrology Field Methods *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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MSTP Electives

must take three (9 hours min.)

MSTP means Math/Science/Technical/Professional

MSTP courses can not be double-counted for any other degree requirement, including USP requirements

CAECM independent learning experiences

CE 4965 Undergraduate Research (3)

CE 4975 Civil and Architectural Engineering Internship (3)

CAECM courses

Any additional PDE Course from the list above

ARE 1600 Architectural Design Studio I (FR and SO only) (3)

ARE 2410 Fundamentals of Building Performance (3)

ARE 2600 Architectural Design Studio II (3)

ARE 3030 History of Architecture (3)

ARE 3300 Building Electrical and Plumbing Systems (3)

ARE 3360 Fundamentals of Transport Phenomena (3)

ARE 3400 Heating, Ventilating and Air Conditioning of Bldgs (3)

ARE 3600 Architectural Design Studio III (3)

CM 2000 Intro to Construction Management (3)

CM 3100 Construction Scheduling (3)

CM 3210 Construction Estimating (3)

ES 3010 Culture and Engineering in Latin America (3)

Engineering courses

CHE 2005 Chemical Process Analysis

CHE 2060 Chemical Engineering Computing

CHE 3015 Chemical Thermodynamics II

CHE 4000 Environment, Technology and Society

EE 3150 Electromagnetics

EE 3310 Electronics I

EE 3510 Electric Machines and Power Systems

EE 4510 Power Systems

ES 2210 Electric Circuit Analysis

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

PETE 2050 Fundamentals of Petroleum Engineering

PETE 2060 Introduction to Petroleum Engineering Computing

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MSTP Electives (cont.)

Technical/Professional courses

COSC 1030 Computer Science I (4)
Plus all COSC courses that have COSC 1030 as a prerequisite
ENR 2000 Environment and Society (3)
ENR 2300 Foundations of Sustainability (3)
ENR 2330 Environmental Ethics (3)
ENR 2345 Natural Resource Ethics (3)
ENR 3000 Approaches to ENR Problem Solving (3)
ENR 3900 Seminar in Environment and Natural Resources (1-3)
ENR 4500 Risk Analysis (4)
ENR 4600 Campus Sustainability (3)
ENR 4900 ENR Policy in Practice (3)
FIN 2100 Principles of Finance (3)
GEOG 4080 Mgmt of Major Rivers
GIST XXXX Any GIST class
LS XXXX Any LS class
MGT 1040/2010 Legal Environment of Business (3)
MGT 2030 Principle-Based Ethics (3)
MGT 2100 Management and Organization (3)

Mathematics & Statistics courses

MATH 2250 Elementary Linear Algebra (3)
MATH 2300 Discrete Structures (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/STAT 4255 Mathematical Theory of Probability (3)
MATH 4300 Introduction to Mathematical Modeling (3)
MATH 4340 Numerical Methods... (3)
MATH 4440 Introduction to Partial Differential Equations I (3)
MATH 4500 Matrix Theory (3)
MATH 5310 Computational Methods in Applied Sciences I (3)
STAT 3050 Statistical Methods (3)
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)

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MSTP Electives (cont.)

Science Electives

AECL 2010 Introduction to Soil Science (4)
AECL 3030 Ecological Web: Ecology of Plant Protection (3)
ASTR 2310 General Astronomy I (4)
ATSC 2000 Introduction to Meteorology (3)
ATSC 2100 Global Warming: The Science (3)
ATSC 4320 The Ocean Environment (3)
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: Managing Earth's Resources (4)
GEOL 2000 Geochemical Cycles and the Earth System (4)
GEOL 3600 Earth and Mineral Resources (4)
GEOL 4113 Geological Remote Sensing (3)
GEOL 4444 Geohydrology (3)
Plus all Geology courses that have GEOL 1100 as a prerequisite.
LIFE 1010 General Biology (4)
Plus all Biology, Botany, and Zoology courses that have LIFE 1010 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.

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)