Approved Electives for ARE

Updated September 2016

Junior Electives must take **two**

ARE 3300 Plumbing & Electrical Systems (3)
ARE 3400 HVAC of Buildings (3)
CE 3600 Soil Mechanics (3)

Option Electives must take **five**

Third Junior Elective (3)

Structural Courses

ARE 4200 Structural Analysis II (3)
ARE 4250 Structural Steel Design (3)
ARE 4260 Structural Concrete Design (3)
ARE 4285 Reinforced Masonry Design (3) (every 3rd semester)
ARE 4295 Structural Timber Design (3) (every 3rd semester)
CE 4610 Foundation Engineering (3)
CE 4620 Rock & Soil Slope Engineering (3)
CE 4630 Geotechnical Engineering (3)
CE 4820 Groundwater and Drainage Engineering (3)
CE 5010 Advanced Mechanics of Materials (3)
CE 5200 Advanced Structural Analysis (3)
CE 5220 Structural Dynamics (3) (every 3rd semester)
CE 5255 Advanced Steel Design (3)
CE 5260 Prestressed Concrete Design (3)
CE 5270 Highway Bridge Engineering (3)

Mechanical Courses

ARE 3360 Fundamentals of Transport Phenomena
ARE 4330 Building Electrical Systems (3)
ARE 4390 Bldg Safety & Fire Protection (3)
ARE 4430 HVAC Systems Analysis and Design (3)
ARE 4490 Modeling and Optimization of Energy Systems (3)
ME 3040 Thermodynamics II (3)
ME 3170 Machine Design (3)
ME/ESE 4460 Solar and Geothermal Energy (3)
ME/ESE 4470 Wind and Ocean Engineering (3)

Major Electives must take **two**

Any additional Option Elective from the list above (3)
AMST 4900 Field Studies in Historic Preservation (3)
AMST 5400 American Built Environment (3)
ARE 4050 Modern Engineering Practice (3) *usually offered Study Abroad*
ARE 4400 Building Energy Economics (3)
ARE 4920 Special Topics (3)
ARE 5600 Collaborative BIM Design (3)
ARE 5700 Architectural Engineering Problems (3)
CE 2070 Engineering Surveying (3)
CE 3300 Hydraulics Engineering (3)

Approved Electives for ARE

Updated September 2016

CE 3400 Intro to Environmental Engineering (3)
CE 3500 Transportation Engineering (3)
CE 4965 Undergraduate Research
CE 4970 Design Squad Coop (3)
CE 4975 Civil and Architectural Engineering Internship (3)
ENR 4600 Campus Sustainability (3)
FCSC 5101 Special Topics: Green Design (3)

Mathematics / Science 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 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 4260) (3)

Science Electives

ASTR 2310 General Astronomy (4)
ATSC 2000 Introduction to Meteorology (3)
ATSC 2100 Atmospheric Change: Composition and Climate (3)
ATSC 4001 Modeling the Earth System (3)
ATSC 4031 Atmospheric Dynamics (3)
ATSC 4033 Atmospheric Remote Sensing (3)
ATSC 4035 Atmospheric Processes II (3)
ATSC 4320 The Ocean Environment (3)
ATSC 4400 The Physical Basis of Climate (3)
ATSC 4410 Introduction to Micrometeorology (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.
GEOL 1100 Physical Geology (4)

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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)
GEOL 4444 Geohydrology (3)
Plus all Geology courses that have GEOL 1100 or 1200 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 (only if taken before or concurrently with ES 2120) (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)