Course Name	Faculty Qualifications Needed	Related Disciplines	Acceptable Alternative Qualifications
AREN 1111 Architectural Graphics	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Architecture	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or architecture, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 2011 Architectural Design I	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Architecture	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or architecture, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 2110 Introduction to Building Systems	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Mechanical Engineering, Building Science, Construction Engineering, Architectural Technology	Acceptable alternative qualifications include substantial professional experience in building systems design, HVAC engineering, or construction management. Relevant expertise may include Professional Engineer (PE) licensure, LEED accreditation, experience with building information modeling (BIM), and knowledge of building codes and standards. Peer-reviewed publications, building design projects, or instructional materials in building systems engineering will also be considered.
AREN 2130 Lighting and Power System Design I	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Electrical Engineering, Building Engineering, Illumination Engineering, Construction Engineering, Energy Systems	Acceptable alternative qualifications include substantial professional experience in electrical systems design, lighting design, or power distribution for buildings. Relevant expertise may include Professional Engineer (PE) licensure, LC (Lighting Certified) credentials from NCQLP, experience with lighting simulation software, and knowledge of NEC and energy codes. Peer-reviewed publications, lighting design projects, or instructional materials in architectural lighting and electrical systems will also be considered.
AREN 2131 Lighting and Power System Design Lab	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Electrical Engineering, Building Engineering, Illumination Engineering, Construction Engineering, Energy Systems	Acceptable alternative qualifications include substantial professional experience in laboratory instruction for electrical and lighting systems, hands-on building systems testing, or electrical engineering pedagogy. Relevant expertise may include Professional Engineer (PE) licensure, experience with lighting measurement equipment, photometric analysis tools, and lab safety protocols. Peer-reviewed publications, laboratory manual development, or instructional materials in electrical systems experimentation will also be considered.
AREN 2210 Building Energy and Built Environment	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Mechanical Engineering, Energy Engineering, Building Science, Environmental Engineering, Sustainable Design	Acceptable alternative qualifications include substantial professional experience in building energy modeling, sustainability consulting, or energy-efficient building design. Relevant expertise may include LEED AP credentials, Certified Energy Manager (CEM) certification, experience with energy simulation software such as EnergyPlus or eQUEST, and knowledge of green building standards. Peer-reviewed publications, energy audit projects, or instructional materials in building energy performance will also be considered.
AREN 2300 Building Materials and Construction	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or building, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 2301 Construction Survey Laboratory	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Civil Engineering, Surveying Engineering, Geomatics, Construction Engineering, Land Surveying	Acceptable alternative qualifications include substantial professional experience in construction surveying, land surveying, or geospatial measurement techniques. Relevant expertise may include Professional Land Surveyor (PLS) licensure, experience with total stations and GPS surveying equipment, digital terrain modeling, and construction layout procedures. Experience with laboratory instruction, hands-on surveying equipment demonstration, and field exercise supervision is highly relevant. Peer-reviewed publications, surveying projects, or instructional materials in construction surveying and geomatics will also be considered.
AREN 2310 Architectural History	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Architecture	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or architecture, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3010 Building Mechanical System Design	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Mechanical Engineering, HVAC Engineering, Building Science, Energy Systems Engineering, Architectural Technology	Acceptable alternative qualifications include substantial professional experience in HVAC system design, mechanical engineering for buildings, or thermal comfort analysis. Relevant expertise may include Professional Engineer (PE) licensure in mechanical engineering, experience with load calculation software, duct and piping design, and knowledge of ASHRAE standards. Peer-reviewed publications, mechanical system design projects, or instructional materials in building HVAC systems will also be considered.
AREN 3011 Building Mechanical System Design Lab	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Mechanical Engineering, HVAC Engineering, Building Science, Energy Systems Engineering, Architectural Technology	Acceptable alternative qualifications include substantial professional experience in laboratory instruction for HVAC systems, hands-on mechanical equipment testing, or building systems commissioning. Relevant expertise may include Professional Engineer (PE) licensure, experience with airflow measurement, thermal testing equipment, psychrometric analysis, and HVAC system troubleshooting. Peer-reviewed publications, laboratory manual development, or instructional materials in mechanical systems experimentation will also be considered.
AREN 3021 Architectural Design II	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Architecture	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or architecture, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.

AREN 3130 Lighting and Power System Design II	Earned Master's or Doctorate degree in Civil or Architectural Engineering in the teaching discipline; or Master's or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in the teaching discipline.	Electrical Engineering, Building Engineering, Illumination Engineering, Power Systems, Energy Management	Acceptable alternative qualifications include substantial professional experience in advanced lighting design, power distribution systems, or electrical engineering for commercial buildings. Relevant expertise may include Professional Engineer (PE) licensure, LC (Lighting Certified) credentials, experience with daylight integration, emergency power systems, and smart lighting controls. Peer-reviewed publications, advanced lighting projects, or instructional materials in electrical and lighting system integration will also be considered.
AREN 3380 Construction Safety	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Construction Management, Building, Industrial Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3410 Structural Analysis	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3420 Reinforced Concrete Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3440 Steel Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3450 Construction Cost Estimating	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or quantity surveying, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3460 Wood and Masonry Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or building, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3480 Introduction to Virtual Design and Construction	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3490 Construction Scheduling	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or quantity surveying, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3570 Steel and Reinforced Concrete Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 3580 Advanced Steel and Reinforced Concrete Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 4220 Adv Mech Syst Buildings	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural/Mechanical Engineering, Building, Architecture, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 4370 Construction Law and Ethics	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Law, Urban Planning, Ethics	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or juris doctor, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 4420 Building Engineering Systems	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 4430 Lighting and Power Systems for Facilities	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Architecture, Electrical Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or architectural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.

AREN 4440 Foundation Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Geotechnical Engineering, Structural Engineering, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or geotechnical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 4450 Energy Conservation in Buildings	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Mechanical Engineering,Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
AREN 4470 Construction Management	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Building, Construction Management	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 2430 Engineering Geology	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Geological Engineering, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or geological engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3000 Introduction to Environmental Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Geological Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3100 Fluid Mechanics	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Mechanical Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3101 Fluid Mechanics Laboratory	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Mechanical Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3130 Soil Mechanics	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Geotechnical Engineering, Geological Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or geotechnical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3131 Soil Mechanics Lab	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Geotechnical Engineering, Geological Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or geotechnical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3200 Transportation Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Transportation Engineering, Urban and Regional Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or transportation engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3250 Hydraulic Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Mechanical Engineering, Environmental Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3300 Water Resource Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3350 Hydrology	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Geosciences	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environemental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3380 Construction Safety and Environment Management	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Construction Management, Building, Industrial Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3400 Structural Testing	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3410 Structural Analysis	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.

CVEN 3420 Reinforced Concrete Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Engineering Mechanics	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3440 Steel Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Engineering Mechanics	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3450 Rock Mechanics	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Geotechnical Engineering, Applied Mechanics, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or geotechnical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3480 Introduction to Virtual Design and Construction	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Building, Architecture, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 3490 Construction Scheduling	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or quantity surveying, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4050 Transportation Modeling	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Transportation Engineering, Urban and Regional Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or transportation engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4090 Traffic Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Transportation Engineering, Urban and Regional Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or transportation engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4110 Design of Hydraulic Structures	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Geosciences	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environemental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4220 Hydrologic Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Hydrologic Engineering, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or hydrologic engineering relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4250 Water and Wastewater Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Water Resources Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4280 Solid Waste Management	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Environmental Science	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4290 Air Pollution Control	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Environmental Science	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environmental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4320 Highway Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Transportation Engineering, Urban and Regional Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or transportation engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4350 Hazardous Waste Management	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Environmental Science	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environemental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4361 Environmental Engineering Laboratory	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Environmental Science	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or environemental engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4370 Construction Law and Ethics	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Law, Urban Planning, Ethics	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or juris doctor, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.

CVEN 4430 Advanced Reinforced Concrete Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Structural Engineering, Building, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or structural engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4440 Foundation Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or geotechnical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4450 Construction Cost Estimating	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or quantity surveying, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4470 Construction Project Management	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Contruction, Building Technology, Construction Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or building, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
CVEN 4520 Civil Engineering Design	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Architecture, Structural Engineering, Urban Planning	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or architecture, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
ENGR 2130 Mechanics of Materials	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Mechanical Engineering, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
ENGR 2131 Mechanics of Materials Lab	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Mechanical Engineering, Materials Science and Engineering	Acceptable alternative qualifications include substantial professional experience (e.g., publications, awards) in civil and architectural engineering or mechanical engineering, relevant professional licensure/certifications, and notable scholarly work such as published articles or conference presentations in civil and architectural engineering related fields.
ENGR 2610 Introduction to Mining Engineering	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Resource Engineering, Mining Engineering, Geological Engineering	Acceptable alternative qualifications include substantial professional experience in the mining or mineral extraction industry, with demonstrated expertise in surface and underground mining methods, critical mineral resource management, and mining sustainability practices. Experience with regulatory frameworks, environmental impact mitigation, and practical mine safety or design in an industrial or academic setting will also be considered.
ENGR 3610 Surface and Underground Methods	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Resource Engineering, Mining Engineering, Geological Engineering	Acceptable alternative qualifications include extensive professional experience in surface and underground mining operations, with demonstrated expertise in mine planning and design, equipment selection, drilling and blasting techniques, and production scheduling. Industry experience involving materials handling systems, mine drainage management, and mining safety compliance, including involvement in case studies, technical presentations, or consulting work in operational mining environments, will also be considered.
ENGR 4610 Mine Ventilation and Laboratory	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Resource Engineering, Mining Engineering, Geological Engineering	Acceptable alternative qualifications include substantial professional experience in underground mining environments, specifically in designing, modeling, or managing mine ventilation systems. Expertise in airflow dynamics, fan systems, air quality monitoring, and controlling underground hazards such as gases, dust, and temperature is essential. Experience using computational tools for ventilation network analysis or leading ventilation safety audits and compliance in operational mining contexts will also be considered.
ENGR 4630 Mineral Processing and Resource Recovery	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Resource Engineering, Mining Engineering, Geological Engineering	Acceptable alternative qualifications include substantial industry or academic experience in mineral beneficiation, physical separation methods, or environmental aspects of resource recovery. Demonstrated expertise in unit operations such as froth flotation, comminution, magnetic or gravity separation, and surface chemistry for mineral treatment is required. Experience with waste minimization strategies, sustainability practices in mineral processing, or the application of computational tools to optimize process design may also be considered.
ENGR 4650 Mineral Economics & Feasibility	Earned Masters or Doctorate degree in Civil and Architectural Engineering in the teaching discipline; or Masters or Doctorate degree with a concentration in the teaching discipline with at least 18 graduate semester hours in Civil and Architectural Engineering.	Environmental Engineering, Resource Engineering, Mining Engineering, Geological Engineering	Acceptable alternative qualifications include substantial professional or academic experience in mining finance, project feasibility, or mineral market analysis. Demonstrated expertise in financial modeling, cost estimation, risk assessment, and sustainability in mining projects is required. Industry leadership roles, consulting experience, or peer-reviewed contributions in the field of mineral economics or mining investment may also be considered.