College of Engineering
Proposed Catalog Changes
Effective Summer 2020

Department of Civil and Environmental Engineering

1. Make the following changes to the **M.Engr. in Civil Engineering**:

Civil Engineering (M.Engr.)

A thesis is not required for the Master of Engineering degree.

Course requirements in the M.Eng. degree program are relatively flexible depending on student interest and course availability. This degree may be completed on a part-time basis and entirely online. Students in this degree program are not eligible to receive graduate assistantships.

Graduate study is offered with specialization in structures, highway and pavement materials, soil mechanics, transportation, hydraulics and water resources, geological engineering and environmental engineering.

All admission requirements for the College of Graduate Studies apply. Applicants for admission generally will have a B.S. degree in civil engineering; however, those with B.S. degrees in other areas (e.g., other areas of engineering, mathematics, physics) are also eligible for admission.

Graduate degree applicants not holding B.S. degrees in civil engineering are required to show evidence of completing the following undergraduate coursework: mathematics through differential equations, and one semester each of chemistry, calculus-based physics and engineering statics. Once admitted, additional preparatory coursework will be determined by the student's advisory committee and/or as prerequisites to courses listed in the student's study plan.

Candidates for graduate study must fulfill the requirements of the College of Graduate Studies and of the Department of Civil & Environmental Engineering. A minimum of ~~33~~ 30 credits is required for the Master of Engineering degree. A thesis is not required, but M.Engr. degree candidates are required to demonstrate to their academic advisor and committee the ability to write a technical paper or report and to complete a comprehensive exam. Further information about the technical writing requirement and the comprehensive exam are provided in the Civil and Environmental Engineering Graduate Student Handbook.

Department of Computer Science

1. Add the following courses:

CS 477 Python for Machine Learning
3 credits
Joint-listed with CS 577
Python is widely used for Machine Learning and Data Science. This course introduces students to current approaches and techniques for finding solutions to Data Science problems using Machine Learning with Python. Topics include: classification, regression, clustering, ensemble learning, and deep learning. The course offers hands-on experiences with Machine Learning techniques using Python-based libraries and also modern tools used by computer and data scientists such as Jupyter Notebook. In this course students will learn: an ability to understand and describe the fundamental concepts and techniques of Machine Learning and their Python-based implementations; an ability to design, implement, and evaluate Python-based Machine Learning solutions for problems such as data classification and clustering. Students will also develop leadership and teamwork abilities through group discussions and projects. Additional work required for graduate credit.
Prereq: (CS 121 or MATH 330) and STAT 301

Geographical Areas: Moscow, Coeur d'Alene, Idaho Falls
Rationale: The course was taught once as a special topic in Fall 2018 and 34 students took the course. There are broad connections from this course to topics in machine/deep learning, AI, data science, computer vision, and digital image processing. Add this course with a formal course number will allow us to teach it continuously to meet the students' needs of training and enable them the necessary skillset. Resources: The instructor Dr. Min Xian is a new hire in the department of computer science for the domain of data science and machine learning. He already created three other new special topic courses CS 404/504 Deep Learning, CS 404/504 Convex Optimization, and CS 404/504 Digital Image Processing. The instructor plans to propose Deep Learning (DL), Python for Machine Learning (PML), and Digital Image Processing (DIP) as permanent courses, to teach DL and DIP in every fall semester, and to teach PML in spring semesters. The course PML was first taught in Fall 2018 as a special topic and received good feedback from students. Students will use open-source software, and their laptops for the hands-on practice part of the courses.

CS 577 Python for Machine Learning
3 credits
Joint-listed with CS 477
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