Computing & Systems MCE Program

Overview

The Computing and Systems (C&S) program leads to a Masters in Civil Engineering (MCE) degree. It is a multidisciplinary program in *computing and systems.* Students may develop an individualized program that emphasizes a C&S area such as *high performance computing, systems & optimization, and numerical algorithms.* They may also select a broad set of additional civil engineering courses or develop depth in a traditional area such as *construction engineering and management, water resources and environmental engineering, geotechnical engineering, structural engineering and mechanics, and transportation engineering*. Since the MCE degree is a course only program, financial support is normally not provided. With careful planning, a student can complete the degree in one year.

Program of Study

The C&S MCE degree requires thirty credit hours (typically ten courses). The program generally consists of at least two C&S core courses (6 credit hours). At least six of the ten courses must be taken within the department. Students have flexibility in choosing courses in consultation with their advisor. Students may also include a 3 or 6 credit hour project course (CE 675) to meet program requirements.

C&S core courses

> CE 536 – Introduction to numerical methods for civil engineers (S)
> CE 537 - Computer Methods and Applications (F)
> CE 591 - Special Topics in Civil Engineering Computing (F,S)
> CE 737 - Computer-Aided Engineering Systems (S)
> CE 791A – High performance computer modeling (F,S)
> CE 791B – Evolutionary computation
> CE 791C – Inverse modeling
> CE 791D – Advanced methods for systems analysis
> CE 7xxx – Complex adaptive systems analysis

Other departmental courses

Other courses within the department may be taken from C&S related areas and traditional CE areas.

C&S related courses

> CE 775 - Modeling and Analysis of Environmental Systems (F)
> CE 776 - Advanced Water Management Systems (S)

CE 796 – Stochastic Methods in Water and Environmental Engineering (F,S)
CE 724 - Probabilistic Methods of Structural Engineering (F)
CE 721 - Matrix and Finite Element Structural Analysis (S)

Other CE courses

Many graduate courses are offered in traditional CE areas. A full listing of CE courses is available on the [departmental course web site](#).

Other recommended courses

Courses outside of civil engineering can be selected from a variety of other departments. Some recommended courses include:

ISE 501 - Introduction to Operations Research (F,S)
MA/ISE 505 – Linear Programming (F,S)
ISE 708 – Integer Programming (S)
ISE 709 – Dynamic Programming (S)
ISE 712 - Bayesian Decision Analysis For Engineers and Managers (S)
MA 501 - Advanced Mathematics for Engineers and Scientists I (F)
MA 502 - Advanced Mathematics for Engineers and Scientists II (S)
MA/CSC 580- Numerical Analysis I
MA/CSC 583 - Introduction to Parallel Computing (S)
MA 584 - Numerical Solution of Partial Differential Equations - Finite Difference Methods (F)
MA 587 - Numerical Solution of Partial Differential Equations - Finite Element Method (S)
MA/ISE/ST 706 Nonlinear Programming (F,S)
CSC 501 - Operating Systems Principles (F,S)
CSC 548 - Parallel Systems (F)

For more information contact:

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