COMPUTATIONAL SCIENCE, MS

Overview

Computational Science is a discipline dedicated to the use of computers for the solution of mathematical equations that describe scientific problems over a wide variety of fields. Its aim is to obtain new scientific information and technical practices. The phenomena approached by Computational Science can range from modeling blood flow to geophysical events, biomolecular processes, turbulence in the motion of liquids and gases, the trajectory of spacecraft, statistics, epidemiology, and more.

Investigators with computational science expertise provide ways of approaching important problems that complement and improve experimental and theoretical approaches by performing simulations outside the ranges of what may be viable by other methods. In this way, computational science informs other studies, generating synergy with scientific and engineering disciplines.

Requirements

Course ID	Title	Credits
Program Requirements		
MATH 7570	Scientific Computatn II (numerical linear algebra or equivalent)	3
MATH 7580	Scientific Computing III (numerical differential equations or equivalent)	3
COSC 6000	C++ Prog For Sci & Engr	3
COSC 6100	Data Visualization	3
COSC 6200	Large Scale Computation	3
One course from Group A (Theory and Applications)		3
Two courses from Group B, one with approval from CCS advisor		6
MATH 9980 & 9980	Masters Research and Masters Research	6
Total Credit Hours		**30**

Course ID	Title	Credits
Group A (theory and applications)		
Take one of the following		
MATH 6470	Analy Methods Appl Math	3
MATH 7310	Applied Mathematics I	3
MATH 7320	Applied Math II	3
BMEN 6420	Transport in Cells and Organs	3
BMEN 6330	Advanced Biofluid Mech	3
CENG 6770	Advances In Biotechnolog	3
CHEM 7120	Statistical Mechanics	3
NSCI 7110	Graduate Neuroscience I	3
PHYS 7170	Quantum Mechanics I	3

Course ID	Title	Credits
Group B (computing courses)		
Take two of the following, one with approval from CCS advisor		
MATH 7740	Topics In Computation	3
CHEM 7140	Computational Quantum Chemistry	3
MATH 7360	Data Analysis	3
CMPS 6130	Intro Comp Geom	3
CMPS 6140	Intro Artificial Intelligence	3
CMPS 6160	Introduction to Data Science	3
CMPS 6210	Algs Comp Struct Bio	3
CMPS 6240	Intro to Machine Learning	3
CMPS 6340	Introduction to Deep Learning	3
CMPS 6360	Data Visualization	3

CMPS 6620	Artificial Intelligence	3
CMPS 6630	Computational Bio & Bioinform	3
CMPS 6640	Advanced Computational Geometry	3