COMPUTATIONAL AND DATA-ENABLED SCIENCE & ENGINEERING (M.S.)

Overview

The Master of Science (M.S.) in Computational and Data-Enabled Science & Engineering (CDS&E) program is an interdisciplinary program, which includes the disciplines of Biology, Chemistry, Computer Science, Engineering, Physical Sciences, and Mathematics & Statistical Sciences. Jackson State University already has strong undergraduate and graduate degree programs in these traditional areas. A PhD program in CDS&E started in the Fall of 2014. The M.S. program in Computational and Data-Enabled Science & Engineering requires a minimum of 36 credit hours beyond the bachelor's degree. The M.S. program in CDS&E serves as a feeder program for the PhD program in CDS&E and will provide a foundation for students to successfully pursue the doctoral program and employment outside of the academy. The program shares resources with the existing STEM programs and operates under the College of Science, Engineering, and Technology (CSET). The M.S. in CDS&E can be completed with a thesis or project.

Curriculum

Project Option

Code	Title	Hours
Core Courses		
CSC 620	DATABASE MANAGEMENT SYSTEMS	3
CSC 552	APPLIED PROGRAMMING	3
CSC 601	COMPUTER ALGORITHMS	3
STAT 661	PROBABILITY AND STATISTICS	3
or STAT 672	COMPUTATIONAL STATISTICS	
Required Courses		
Select one of the following tracks: [1]		9
Track 1: Computational Biology and Bioinformatics		
BIO 605		
BIO 619		
BIO 679		
Track 2: Computational Mathematics and Statistical Sciences		
MATH 670	COMPUTATIONAL METHODS N MATH I	
STAT 672	COMPUTATIONAL STATISTICS	
MATH 673	QUANTITATIVE EXPLORATN OF DATA	
Track 3: Computational Physical Science		
PHY 522		
PHY 533		
PHY 561		
Track 4: Computational Science and Engineering		
CSC 551	PARALLEL & DISTRIBUTED COMPUTI	
CSC 571	PROGRAMMING FOR BIG DATA	
CSC 621	MACHINE LEARNING	
Elective Courses		
12 credit hours of Elective courses [2]		12
Project		
Select one of the following from the following disciplines:		3
BIO 600		
CHEM 579		
CSC 595	INFO SYST & DEVELOP PROJ	
MATH 598		
SCI 587		
Total Hours		**36**

1. A student will choose a particular track for the required courses after consultation with the graduate advisor.
2. Elective Courses will be approved by the student's graduate committee.

Thesis Option

Code	Title	Hours
Core Courses		
CSC 520		3
CSC 552	APPLIED PROGRAMMING	3
CSC 601	COMPUTER ALGORITHMS	3
STAT 661	PROBABILITY AND STATISTICS	3
or STAT 672	COMPUTATIONAL STATISTICS	
Required Courses		
Select one of the following tracks: [1]		9
Track 1: Computational Biology and Bioinformatics		
BIO 605		
BIO 619		
BIO 679		
Track 2: Computational Mathematics and Statistical Sciences		
MATH 670	COMPUTATIONAL METHODS N MATH I	
STAT 672	COMPUTATIONAL STATISTICS	
MATH 673	QUANTITATIVE EXPLORATN OF DATA	
Track 3: Computational Physical Science		
PHY 522		
PHY 533		
PHY 561		
Track 4: Computational Science and Engineering		
CSC 551	PARALLEL & DISTRIBUTED COMPUTI	
CSC 571	PROGRAMMING FOR BIG DATA	
CSC 621	MACHINE LEARNING	
Elective Courses		
9 credit hours of Elective courses [2]		9
Thesis		
Select one of the following from one of the following disciplines		6
BIO 599	THESIS RESEARCH	
CHEM 580	THESIS RESEARCH	
CSC 599	THESIS RESEARCH	
MATH 599	THESIS	
SCI 599		
Total Hours		**36**

1. A student will choose a particular track for the required courses after consultation with the graduate advisor.
2. Elective Courses will be approved by the student's graduate committee.

Elective Courses

Elective Courses will be approved by the student's graduate committee. A list of elective courses is given below (the elective courses can be taken from one or more tracks):

Code	Title	Hours
BIO 623	SYSMS BIO & SIGNALING NETWORKS	3
BIO 689	ADVD TPCS IN COMPUTATIONAL BIO	3
MATH 543	NUMERICAL ANALYSIS	3
MATH 628	ADVD PARTIAL DIFF EQUATIONS I	3
MATH 629	ADVND PARTIAL DIF EQUATIONS II	3
MATH 671	COMPUTATNL METHODS IN MATH II	3
MATH 700	TPCS N MATH & STATS A N CDS&E	3-6
STAT 661	PROBABILITY AND STATISTICS	3
STAT 680	CMPTNL DATA ANLYSIS & VISUAL I	3
CHEM 531	BIOCHEMISTRY	3
CHEM 558	QUANTUM CHEMISTRY	3
CSC 511	OBJECT-ORIENTED PROGRAMMING	3
CSC 537	CLOUD COMPUTING	3
CSC 582	SOCIAL NETWORK ANALYSIS	3
CSC 634	BIG DATA MINING	3
CSC 641	NETWORK SCIENCE	3
CPE 505	ANALYSIS OF ALGORITHMS	3

Special Requirements

To become a candidate for the Master of Science in Computational and Data Enabled Sciences and Engineering, student will have to:

1. Take and pass the Graduate Area Comprehensive Examination (GACE) on the 4 core courses. The eligibility criteria for taking the GACE will be the same as that set by the Graduate School (This requirement is waived for CDS & E Ph.D. students who have passed the Comprehensive Qualifying Examinations). A student will have two chances of passing the GACE exam on the 4 core courses.
2. Additionally, the student will need to present and defend his/her master's Project or Thesis to a committee comprised of the student advisor and committee members.