

MASTER OF SCIENCE IN COMPUTER SCIENCE/MASTER OF CHEMICAL ENGINEERING

Collaborative Program with the Department of Computer Science

This combined program in computer science and chemical engineering addresses the growing need for process engineers with expertise in computational modeling and simulation of chemical processes. Similarly, the program provides a strong engineering background that is required today in many areas of computer science. The program is jointly offered by the Department of Computer Science and the Department of Chemical and Biological Engineering. Students in this program earn both Master of Science in Computer Science and Master of Chemical Engineering degrees.

Students must fulfill the core course requirements of both departments. Students are required to take 18 credit hours in graduate chemical engineering courses (courses numbered 500 or higher) and 26 credit hours in computer science courses (of which 20 credit hours must be 500-level courses).

Curriculum

Code	Title	Credit Hours
Chemical Engineering Courses		(18)
CHE 406	Transport Phenomena	3
CHE 503	Thermodynamics	3
CHE 525	Chemical Reaction Engineering	3
CHE 535	Applications of Mathematics to Chemical Engineering	3
Select a minimum of two courses from the following:		6
CHE 508	Process Design Optimization	3
CHE 530	Advanced Process Control	3
CHE 536	Computational Techniques in Engineering	3
CHE 560	Statistical Quality and Process Control	3
Any other 500-level course must be approved by the academic adviser		
Computer Science Courses		(26)
Students are required to take at least one course from the Programming area; at least one course from the Systems area; at least two courses from the Theory area; and 14 credit hours of computer science elective coursework.		26
Programming Core Courses		
CS 511	Topics in Computer Graphics	3
CS 512	Computer Vision	3
CS 525	Advanced Database Organization	3
CS 540	Syntactic Analysis of Programming Languages	3
CS 541	Topics in Compiler Construction	3
CS 546	Parallel and Distributed Processing	3
CS 551	Operating System Design and Implementation	3
CS 553	Cloud Computing	3
Systems Core Courses		
CS 542	Computer Networks I: Fundamentals	3
CS 544	Computer Networks II: Network Services	3
CS 547	Wireless Networking	3
CS 550	Advanced Operating Systems	3
CS 555	Analytic Models and Simulation of Computer Systems	3
CS 570	Advanced Computer Architecture	3
CS 586	Software Systems Architectures	3
Theory Core Courses		
CS 530	Theory of Computation	3
CS 533	Computational Geometry	3
CS 535	Design and Analysis of Algorithms	3
CS 536	Science of Programming	3

CS 538	Combinatorial Optimization	3
CS 539	Game Theory: Algorithms and Applications	3
Total Credit Hours		44