Portfolio in Scientific Computation - List of Approved Courses

Core Courses	
SDS 392	Intro to Scientific Programming
Introduction to programming using both the C and Fortran (95/2003) languages, with applications to basic scientific problems. Covers common data types and structures, control structures, algorithms, performance measurement, and interoperability. Prerequisite: Credit or registration for Mathematics 408K or 408C.	
SDS 394	Scientific/Technical Computing
Comprehensive introduction to computing techniques and methods applicable to many scientific disciplines and technical applications. Covers computer hardware and operating systems, systems software and tools, code development, numerical methods and math libraries, and basic visualization and data analysis tools. Prerequisite: Graduate standing, and Mathematics 408D or 408M. Prior programming experience is recommended.	
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Suggested Electives (choose one)	
SDS 395	Computational Economics
SDS 394C	Parallel Computing
SDS 394D	Distributed and Grid Computing for Scientists and Engineers
SDS 394E	Visualization and Data Analysis
SDS 395	Advanced Topics in Scientific Computation
ASE 382R-5	Advanced Computational Methods
ASE 384P-4	Finite Element Methods
CS 380D	Distributed Computing I
CS 380N	Systems Modeling
CS 380P	Parallel Systems
CS 383C	Numerical Analysis: Linear Algebra
CS 383D	Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations
CS 384R	Geometric Modeling and Visualization
CS 391D	Data Mining: A Mathematical Perspective
CS 391L	Machine Learning
CS 392C	Methods and Techniques for Parallel Programming
CS 393N	Numerical Solution of Elliptic Partial Differential Equations
CS 393R	Autonomous Robots
CS 394C	Algorithms for Computational Biology
CS 394N	Neural Networks
CS 395T-1	Parallel Computations
CSE 381C	Computational Physics
CSE 382L	Numerical Methods in Petroleum and Geosystems Engineering
CSE 383-2	Topics in Computational Methods
CSE 383C	Numerical Analysis: Linear Algebra
CSE 383D	Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations
CSE 383M	Statistical and Discrete Methods for Scientific Computation
CSE 393M	Numerical Solution of Elliptic Partial Differential Equations
CSE 393N	Numerical Methods for Flow and Transport Problems
CSE 393F	Finite Element Methods

CSE 394G	Computational Techniques in Finite Elements
CSE 395T-1	Parallel Computations
ECO 392M-12	Computational Economics I
ECO 392M-20	Computational Economics II
EE 380K	Introduction to System Theory
EE 380L-1	Data Mining
EE 380L-11	Mining the Web
EE 380L-7	Introduction to Pattern Recognition and Computer Vision
EE 380L-9	Artificial Neural Systems
EE 380N-11	Optimization in Engineering Systems
EE 380N-5	Stochastic Control Theory
EE 380N-8	Algorithms for Parallel and Distributed Computation
EE 381V	Sparsity, Structure and Algorithms
EE 381V	Topics in Network Science
EM 394F	Finite Element Methods
EM 394H	Advanced Theory of Finite Element Methods
M 383E	Numerical Analysis: Linear Algebra
M 383F	Numerical Analysis: Interpolation, Approximation, Quadrature, and Differential Equations
M 383G	Numerical Treatment of Differential Equations
M 393D	Topics in Numerical Analysis
M 393N	Numerical Solution of Elliptic Partial Differential Equations
OM 380-15	Optimization I
OM 380-16	Optimization II
OM 380-3	Network Optimization
OM 380-8	Large-Scale System Optimization
OM 380-9	Stochastic Processes
ORI 391Q-1	Nonlinear Programming
ORI 391Q-10	Stochastic Optimization
ORI 391Q-11	Advanced Mathematical Programming
ORI 391Q-12	Metaheuristics
ORI 391Q-4	Integer Programming
ORI 391Q-5	Linear Programming
ORI 391Q-6	Algorithms for Mixed Integer Programming
ORI 391Q-9	Large-Scale Systems Optimization
PGE 382L	Numerical Methods in Petroleum and Geosystems Engineering
PGE 383-16	Topics in Computational Methods
PHY 381C	Computational Physics
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Independent Study (3 or 4 credits)	
	Under the supervision of the student's Portfolio Program Faculty Adviser, the student must successfully complete a research project designed to apply scientific computation techniques to the student's research area of interest.