MASTER OF SCIENCE IN COMPUTATIONAL SCIENCE AND ENGINEERING

Computational Science and Engineering (*https://catalog.mit.edu/ interdisciplinary/graduate-programs/computational-science-engineering*)

Core Subjects		36
Select three of the following subjects:		
6.7300[J]	Introduction to Modeling and Simulation	
15.C57[J]	Optimization Methods	
16.920[J]	Numerical Methods for Partial Differential Equations	
18.335[J]	Introduction to Numerical Methods	
Restricted Electives [1]		**24**
Choose 24 units of coursework from the list below.		
Unrestricted Elective [1]		**12**
Choose any graduate-level subject. [2]		
Thesis		
CSE.THG	Graduate Thesis	36
Total Units		**108**

[1] Subjects that can be repeated for credit cannot be used to satisfy multiple CSE SM requirements.

[2] See list of subjects offered at MIT (*https://catalog.mit.edu/subjects*).

Restricted Electives

1.125	Architecting and Engineering Software Systems	12
1.545	Atomistic Modeling and Simulation of Materials and Structures	12
1.583[J]	Topology Optimization of Structures	12
1.723	Computational Methods for Flow in Porous Media	12
2.098	Introduction to Finite Element Methods	12
2.156	Artificial Intelligence and Machine Learning for Engineering Design	12
2.168	Learning Machines	12
2.29	Numerical Fluid Mechanics	12
3.320	Atomistic Computer Modeling of Materials	12
4.450[J]	Computational Structural Design and Optimization	12
4.453	Creative Machine Learning for Design	12
6.7210[J]	Introduction to Mathematical Programming	12
6.7220[J]	Nonlinear Optimization	12
6.7230[J]	Algebraic Techniques and Semidefinite Optimization	12
6.7300[J]	Introduction to Modeling and Simulation	12
6.7810	Algorithms for Inference	12
6.7830	Bayesian Modeling and Inference	12
6.7900	Machine Learning	12
6.7940	Dynamic Programming and Reinforcement Learning [1]	12
6.8300	Advances in Computer Vision	12
6.8410	Shape Analysis	12
6.C51	Modeling with Machine Learning: from Algorithms to Applications [2]	6
9.520[J]	Statistical Learning Theory and Applications	12
9.660	Computational Cognitive Science	12
10.551	Systems Engineering [2]	9
10.552	Modern Control Design [2]	9
10.554[J]	Process Data Analytics	12
10.557	Mixed-integer and Nonconvex Optimization	12
10.637[J]	Computational Chemistry	12
12.515	Data and Models	12
12.521	Computational Geophysical Modeling	12
12.620[J]	Classical Mechanics: A Computational Approach	12
12.714	Computational Data Analysis	12
12.805	Data Analysis in Physical Oceanography	12
12.850	Computational Ocean Modeling	12
15.070[J]	Discrete Probability and Stochastic Processes	12
15.077[J]	Statistical Machine Learning and Data Science [1]	12
15.083	Integer Optimization [3]	12
15.764[J]	The Theory of Operations Management	12
15.C57[J]	Optimization Methods	12
16.110	Flight Vehicle Aerodynamics	12
16.225[J]	Computational Mechanics of Materials	12
16.413[J]	Principles of Autonomy and Decision Making	12
16.888[J]	Multidisciplinary Design Optimization	12
16.920[J]	Numerical Methods for Partial Differential Equations	12

16.930	Advanced Topics in Numerical Methods for Partial Differential Equations	12
16.940	Numerical Methods for Stochastic Modeling and Inference	12
18.335[J]	Introduction to Numerical Methods	12
18.336[J]	Fast Methods for Partial Differential and Integral Equations	12
18.337[J]	Parallel Computing and Scientific Machine Learning	12
18.338	Eigenvalues of Random Matrices	12
18.369[J]	Mathematical Methods in Nanophotonics	12
18.435[J]	Quantum Computation	12
22.15	Essential Numerical Methods	6
22.212	Nuclear Reactor Analysis II	12
22.213	Nuclear Reactor Physics III	12
22.315	Applied Computational Fluid Dynamics and Heat Transfer	12
CSE.999	Experiential Learning in Computational Science and Engineering	
IDS.131[J]	Statistics, Computation and Applications	12

[1] Restricted elective credit can only be given for one of 6.7900, 15.077[J], or IDS.147[J].

[2] Students cannot receive credit without simultaneous completion of a 6-unit Common Ground disciplinary module. The two subjects together count as one 12-unit restricted elective. See 6.C51 for more information.

[3] Students receive credit for either 10.551 or 10.552 as a CSE concentration subject, but not both.

[4] Subject to Sloan bidding process.