MASTER OF SCIENCE IN OPERATIONS RESEARCH

The School of Industrial and Systems Engineering (ISYE) offers eight master's degrees:

- Master of Science in Industrial Engineering (MS IE);
- Master of Science in Operations Research (MS OR);
- Master of Science in Supply Chain Engineering (MS SCE);
- Master of Science in Statistics (MS STAT);
- Master of Science in Health Systems (MS HS);
- Master of Science in Quantitative and Computational Finance (MS QCF);
- Master of Science in International Logistics (MS IL) that is part of the executive program; and
- Master of Science in Computational Science and Engineering (MS CSE).

Three of these programs are interdisciplinary:

- MS QCF (joint with School of Mathematics, College of Business),
- MS STAT (joint with School of Mathematics) and
- MS SCE (joint with College of Computing, School of Mathematics).

All proposed master's degree programs require thirty semester credit hours with the exception of MS IL and MS QCF (thirty-six credit hours) and MS HS (thirty-three credit hours). None of these MS programs contains a thesis option.

A student seeking a master's degree must have a bachelor's degree and typically one earned in engineering, science, mathematics, or some other field that provides an adequate background for the successful completion of one of ISyE's programs. Students having backgrounds from unaccredited degree programs or in programs that are found lacking in relative substance can expect to first take preliminary coursework in order to elevate their preparation to the level required. The prerequisite coursework for the various master's degrees includes strong performance in probability, statistics, linear algebra, and calculus.

Every MS curriculum is based on core classes offered from the School of ISyE, as well as electives offered by ISyE and other Georgia Tech schools in engineering and science. The MS SCE, MS QCF, and MS IL are professional degree programs with separate curriculums from the other regular MS degrees.

MS Human-Integrated Systems

Program Requirements

Code	Title	Credit Hours
Core		
ISYE 6644	Simulation	3
ISYE 6650	Probabilistic Models and Their Applications	3
ISYE 6669	Deterministic Optimization	3
Statistics and Data Science Elective		**3**
MATH 4261	Mathematical Statistics I	
ISYE 6412	Theoretical Statistics	
ISYE 6414	Statistical Modeling and Regression Analysis	
or ISYE 7	Advanced Statistical Modeling	
or MATH	Linear Statistical Models	
ISYE 6740	Computational Data Analysis: Learning, Mining, and Computation	
ISYE 6413	Design and Analysis of Experiments	
or ISYE 7	Advanced Design of Experiments	
ISYE 6416	Computational Statistics	
ISYE 6420	Introduction to Theory and Practice of Bayesian Statistics	
MATH 6262	Advanced Statistical Inference I	
MATH 6263	Testing Statistical Hypotheses	
Algorithms and Computation Elective		**3**
ISYE 6679	Computational Methods in Optimization	
ISYE 6740	Computational Data Analysis: Learning, Mining, and Computation	
ISYE 8813	Special Topics in Operations Research (Constraint Programming)	
CS 6505	Computability, Algorithms, and Complexity	
CS 6520	Computational Complexity Theory	
CS 6550	Design and Analysis of Algorithms	
CSE 6140	Computational Science and Engineering Algorithms	
Technical Electives (Choose 3)		**9**
ISYE 6230	Economic Decision Analysis	
ISYE 6307	Scheduling Theory	
ISYE 6320	Public Impact Applications of Operations Research and Management Science	
ISYE 6645	Monte Carlo Methods	
ISYE 6661	Linear Optimization	
ISYE 6662	Discrete Optimization	
ISYE 6663	Nonlinear Optimization	
ISYE 6664	Stochastic Optimization	
ISYE 6679	Computational Methods in Optimization	
ISYE 6761	Stochastic Processes I	
ISYE 6762	Stochastic Processes II	
ISYE 6832	Simulation Theory and Methods	
ISYE 7201	Production and Service Systems Engineering	
ISYE 7203	Logistics Systems Engineering	
ISYE 8813	Special Topics in Operations Research (Inventory Theory)	
ISYE 8813	Special Topics in Operations Research (Constraint Programming)	
ISYE 8813	Special Topics in Operations Research (Stochastic Programing)	
ISYE 8813	Special Topics in Operations Research (Game Theory)	
ISYE 8813	Special Topics in Operations Research (Infrastructure Optimization)	
Breadth Electives (Choose 2)		**6**
ISYE 6225	Advanced Engineering Economy	
ISYE 6201	Manufacturing Systems	
or ISYE 7201	Production and Service Systems Engineering	
ISYE 6202	Warehousing Systems	
ISYE 6203	Transportation and Supply Chain Systems	

	or ISYE 7203	Logistics Systems Engineering
	ISYE 8813	Special Topics in Operations Research (Inventory Theory)
	ISYE 6405	Statistical Methods for Manufacturing Design and Improvement
	ISYE 6402	Time Series Analysis
	ISYE 6404	Nonparametric Data Analysis
	ISYE 6413	Design and Analysis of Experiments
	or ISYE 7400	Advanced Design of Experiments
	ISYE 6414	Statistical Modeling and Regression Analysis
	or ISYE 7401	Advanced Statistical Modeling
	or MATH 6266	Linear Statistical Models
	ISYE 6416	Computational Statistics
	ISYE 6420	Introduction to Theory and Practice of Bayesian Statistics
	ISYE 7406	Data Mining and Statistical Learning
	ISYE 8813	Special Topics in Operations Research (Mathematics of Operations Research)
	ISYE 6740	Computational Data Analysis: Learning, Mining, and Computation
	CSE 6242	Data and Visual Analytics
	CSE 6730	Modeling and Simulation: Foundations and Implementation
	MATH 4317	Analysis I
	MATH 6337	Real Analysis I
	MATH 6338	Real Analysis II
	MATH 6014	Graph Theory and Combinatorial Structures
	MATH 6241	Probability I
	MATH 6242	Probability II
	MATH 6643	Numerical Linear Algebra
	MATH 6262	Advanced Statistical Inference I
	MATH 6263	Testing Statistical Hypotheses
	CS 6236	Parallel and Distributed Simulation Systems
	CS 6505	Computability, Algorithms, and Complexity
	CS 6520	Computational Complexity Theory
	CS 6550	Design and Analysis of Algorithms
Total Credit Hours		30

Practicum Track Requirements

Code	Title	Credit Hours
Core		
ISYE 6650	Probabilistic Models and Their Applications	3
ISYE 6669	Deterministic Optimization	3
Statistics and Data Science Elective		**3**
MATH 4261	Mathematical Statistics I	
ISYE 6412	Theoretical Statistics	
ISYE 6414	Statistical Modeling and Regression Analysis	
or ISYE 7401	Advanced Statistical Modeling	
or MATH 6266	Linear Statistical Models	
ISYE 6740	Computational Data Analysis: Learning, Mining, and Computation	
ISYE 6413	Design and Analysis of Experiments	
or ISYE 7400	Advanced Design of Experiments	
ISYE 6416	Computational Statistics	
ISYE 6420	Introduction to Theory and Practice of Bayesian Statistics	
MATH 6262	Advanced Statistical Inference I	
MATH 6263	Testing Statistical Hypotheses	
Algorithms and Computation Elective		**3**
ISYE 6679	Computational Methods in Optimization	
ISYE 6740	Computational Data Analysis: Learning, Mining, and Computation	
ISYE 8813	Special Topics in Operations Research (Constraint Programming)	
CS 6505	Computability, Algorithms, and Complexity	
CS 6520	Computational Complexity Theory	
CS 6550	Design and Analysis of Algorithms	
CSE 6140	Computational Science and Engineering Algorithms	
Technical Electives (Choose 3)		**9**
ISYE 6230	Economic Decision Analysis	
ISYE 6307	Scheduling Theory	
ISYE 6320	Public Impact Applications of Operations Research and Management Science	
ISYE 6645	Monte Carlo Methods	
ISYE 6661	Linear Optimization	
ISYE 6662	Discrete Optimization	
ISYE 6663	Nonlinear Optimization	
ISYE 6664	Stochastic Optimization	
ISYE 6679	Computational Methods in Optimization	
ISYE 6761	Stochastic Processes I	
ISYE 6762	Stochastic Processes II	
ISYE 6832	Simulation Theory and Methods	
ISYE 7201	Production and Service Systems Engineering	
ISYE 7203	Logistics Systems Engineering	
ISYE 8813	Special Topics in Operations Research (Inventory Theory)	
ISYE 8813	Special Topics in Operations Research (Constraint Programming)	
ISYE 8813	Special Topics in Operations Research (Stochastic Programing)	
ISYE 8813	Special Topics in Operations Research (Game Theory)	
ISYE 8813	Special Topics in Operations Research (Infrastructure Optimization)	
Breadth Electives (Choose 2)		**6**
ISYE 6225	Advanced Engineering Economy	
ISYE 6201	Manufacturing Systems	
or ISYE 7201	Production and Service Systems Engineering	
ISYE 6202	Warehousing Systems	
ISYE 6203	Transportation and Supply Chain Systems	
or ISYE 7203	Logistics Systems Engineering	
ISYE 8813	Special Topics in Operations Research (Inventory Theory)	
ISYE 6405	Statistical Methods for Manufacturing Design and Improvement	

ISYE 6402	Time Series Analysis	
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MATH 4317	Analysis I	
MATH 6337	Real Analysis I	
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CS 6236	Parallel and Distributed Simulation Systems	
CS 6505	Computability, Algorithms, and Complexity	
CS 6520	Computational Complexity Theory	
CS 6550	Design and Analysis of Algorithms	
Internship Preparation Elective [1]		**3**
ISYE 6230	Economic Decision Analysis	
ISYE 6644	Simulation	
ISYE 6701	Energy Technology and Policy	
Practicum		
COOP/INTN/ISYE	Practicum	
Total Credit Hours		30

[1] ISYE Special Topics courses, as appropriate