

SPRING 2020 MSIE ELECTIVES

READ CAREFULLY: The courses listed below are approved electives for MSIE students. If a course of your interest is not listed, you must obtain written approval from an advisor (and forward it to advising@ieor.columbia.edu). Include the course title, description and syllabus in your email. Courses below 4000-level (i.e. 3000 - 1000 levels) are not permissible and do not count towards the MS degree.

MS in Industrial Engineering

CSOR E4231 Analysis of Algorithms I
IEME E4200 Human-Centered Design & Innovation (Application by SSOL Waitlist)
IEOR E4008 Computational Discrete Optimization
IEOR E4208 Seminar in Human Factors
IEOR E4312 Application of OR & AI Techniques in Marketing (1st Half; 1.5 credits)
IEOR E4404 Simulation
IEOR E4405 Production Scheduling
IEOR E4412 Quality Control & Management
IEOR E4418 Transportation Analytics & Logistics
IEOR E4501 Tools for Analytics
IEOR E4507 Healthcare Operations Management
IEOR E4510 Project Management
IEOR E4521 Systems Engineering, Tools & Methods
IEOR E4523 Data Analytics (IEOR E4501 is co-requisite)
IEOR E4525 Machine Learning FE & OR
IEOR E4526 Analytics on the Cloud (IEOR E4523 is a prerequisite)
IEOR E4540 Data Mining for Engineers
IEOR E4561 Launch Your Startup: Tech
IEOR E4562 Innovate Using Design Thinking (Blockweek: 1/13-1/17)
IEOR E4570 Entrepreneurship Bootcamp for Engineers (Class: 1/24-1/26; 1.5 credits) (Application by SSOL Waitlist)
IEOR E4572 Visualization & Storytelling with Data (2nd Half; 1.5 credits)
IEOR E4573 Performance, Objectives & Results Using Data Analytics (1st Half; 1.5 credits)
IEOR E4575 Technology for Real Estate & The Built Environment (1st Half; 1.5 credits)
IEOR E4576 Advanced Financial Machine Learning: Factor Investing & Asset Allocation (1.5 credits)
IEOR E4577 AI for Operations Research (1.5 credits)
IEOR E4601 Dynamic Pricing & Revenue Management
IEOR E4602 Quantitative Risk Management
IEOR E4630 Asset Allocation
IEOR E4700 Intro to Financial Engineering
IEOR E4718 Beyond Black-Scholes: Implied Volatility Smile (Priority MSFE)
IEOR E4734 Foreign Exchange & Related Derivatives (1st Half; 1.5 credits)
IEOR E4742 Deep Learning (Priority MSFE)
IEOR E4900 Master's Research or Project
IEOR E4998 Managing Technological Innovation
IEOR E4999 Fieldwork (1-1.5 credits)

Business School (register via [cross-registration](#))

See: [Pre-Approved List of CBS Electives](#)

*Priority registration to MSE and MSBA students for DROM Section 060/061 courses
DROM B8110-060/061 Business Analytics Strategy
DROM B8116-060 Risk Management
DROM B8816-060 Quantitative Pricing & Revenue Analytics (1st Half; 1.5 credits)
FINC B8307-060 Advanced Corporate Finance

SPRING 2020 MSOR ELECTIVES

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MS in Operations Research

CSOR E4231 Analysis of Algorithms I
IEME E4200 Human-Centered Design & Innovation (Application by SSOL Waitlist)
IEOR E4008 Computational Discrete Optimization
IEOR E4108 Supply Chain Analytics
IEOR E4208 Seminar in Human Factors
IEOR E4312 Application of OR & AI Techniques in Marketing (1st Half; 1.5 credits)
IEOR E4405 Production Scheduling
IEOR E4412 Quality Control & Management
IEOR E4418 Transportation Analytics & Logistics
IEOR E4501 Tools for Analytics
IEOR E4507 Healthcare Operations Management
IEOR E4510 Project Management
IEOR E4521 Systems Engineering, Tools & Methods
IEOR E4523 Data Analytics (IEOR E4501 is co-requisite)
IEOR E4525 Machine Learning FE & OR
IEOR E4526 Analytics on the Cloud (IEOR E4523 is prerequisite)
IEOR E4540 Data Mining for Engineers
IEOR E4561 Launch Your Startup: Tech
IEOR E4562 Innovate Using Design Thinking (Blockweek: 1/13-1/17)
IEOR E4570 Entrepreneurship Bootcamp for Engineers (Class: 1/24-1/26; 1.5 credits) (Application by SSOL Waitlist)
IEOR E4572 Visualization & Storytelling with Data (2nd Half; 1.5 credits)
IEOR E4573 Performance, Objectives & Results Using Data Analytics (1st Half; 1.5 credits)
IEOR E4575 Technology for Real Estate & The Built Environment (1st Half; 1.5 credits)
IEOR E4576 Advanced Financial Machine Learning: Factor Investing & Asset Allocation (1.5 credits)
IEOR E4577 AI for Operations Research (1.5 credits)
IEOR E4601 Dynamic Pricing & Revenue Management
IEOR E4602 Quantitative Risk Management
IEOR E4630 Asset Allocation
IEOR E4700 Intro to Financial Engineering
IEOR E4718 Beyond Black-Scholes: Implied Volatility Smile (Priority MSFE)
IEOR E4734 Foreign Exchange & Related Derivatives (1st Half; 1.5 credits)
IEOR E4742 Deep Learning (Priority MSFE)
IEOR E4900 Master's Research or Project
IEOR E4998 Managing Technological Innovation
IEOR E4999 Fieldwork (1-1.5 credits)

Business School (register via [cross-registration](#))

See: [Pre-Approved List of CBS Electives](#)

*Priority registration to MSE and MSBA students for DROM Section 060/061 courses
DROM B8110-060/061 Business Analytics Strategy
DROM B8116-060 Risk Management
DROM B8816-060 Quantitative Pricing & Revenue Analytics (1st Half; 1.5 credits)
FINC B8307-060 Advanced Corporate Finance

SPRING 2020 MSFE CORE & ELECTIVES

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MS in Financial Engineering Spring Core

IEOR E4703 Monte Carlo Simulation
IEOR E4707 FE: Continuous Time Models
IEOR E4709 Statistical Analysis & Time Series
Attend Spring 2020 FE Seminars

FE Electives

CSOR E4231 Analysis of Algorithms I
DROM B8116-060 Risk Management (SSOL Registration)
FINC B8307-060 Advanced Corporate Finance (SSOL Registration)
IEOR E4525 Machine Learning FE & OR
IEOR E4540 Data Mining for Engineers
IEOR E4601 Dynamic Pricing & Revenue Management
IEOR E4602 Quantitative Risk Management
IEOR E4630 Asset Allocation
IEOR E4718 Beyond Black-Scholes: Implied Volatility Smile
IEOR E4729 Algorithmic Trading: Theory & Practice
IEOR E4734 Foreign Exchange & Related Derivatives (1st Half; 1.5 credits)
IEOR E4742 Deep Learning
IEOR E4900 Master's Research or Project
IEOR E4999 Fieldwork (1-1.5 credits)

Business School Electives (register via [cross-registration](#))

See: [Pre-Approved List of CBS Electives](#)

SPRING 2020 MS&E ELECTIVES

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Analysis Electives (at least 3 credits; 9 credits total for Management & Analysis)

CSOR E4231 Analysis of Algorithms I
IEOR E4008 Computational Discrete Optimization
IEOR E4312 Application of OR & AI Techniques in Marketing (1st Half; 1.5 credits)
IEOR E4405 Production Scheduling
IEOR E4418 Transportation Analytics & Logistics
IEOR E4501 Tools for Analytics
IEOR E4507 Healthcare Operations Management
IEOR E4521 Systems Engineering, Tools & Methods
IEOR E4523 Data Analytics (IEOR E4501 is a co-requisite)
IEOR E4525 Machine Learning FE & OR
IEOR E4526 Analytics on the Cloud (IEOR E4523 is a prerequisite)
IEOR E4540 Data Mining for Engineers
IEOR E4572 Visualization & Storytelling with Data (2nd Half; 1.5 credits)
IEOR E4573 Performance, Objectives & Results Using Data Analytics (1st Half; 1.5 credits)
IEOR E4575 Technology for Real Estate & The Built Environment (1st Half; 1.5 credits)
IEOR E4577 AI for Operations Research (1.5 credits)
IEOR E4601 Dynamic Pricing & Revenue Management
IEOR E4742 Deep Learning (Priority MSFE)

Management Electives (at least 3 credits; 9 credits total for Management & Analysis)

FINC B8307-060 Advanced Corporate Finance
IEME E4200 Human-Centered Design & Innovation (Application by SSOL Waitlist)
IEOR E4412 Quality Control & Management
IEOR E4510 Project Management
IEOR E4561 Launch Your Startup: Tech
XXXX Innovate Using Design Thinking (Blockweek: 1/13-1/17)
IEOR E4570 Entrepreneurship Bootcamp for Engineers (Class: 1/24-1/26; 1.5 credits) (Application by SSOL Waitlist)
IEOR E4998 Managing Technological Innovation

Decision, Risk and Operations Electives (at least 9 credits total; DROM Section 060 and 061 courses are by SSOL registration)

DROM B8106-060 Operations Strategy
DROM B8108-060 Supply Chain Analytics
DROM B8110-060/061 Business Analytics Strategy
DROM B8116-060 Risk Management
DROM B8816-060 Quantitative Pricing & Revenue Analytics (1st Half; 1.5 credits)
IEOR E4650-001/002 Business Analytics

Additional Business School Courses (MSE & MSBA students register via [BOSS](#))

See: [Pre-Approved List of CBS Electives](#)

IEOR Breadth Electives

IEOR E4208 Seminar in Human Factors
IEOR E4576 Advanced Financial Machine Learning: Factor Investing & Asset Allocation (1.5 credits)
IEOR E4602 Quantitative Risk Management
IEOR E4630 Asset Allocation
IEOR E4700 Intro to Financial Engineering
IEOR E4718 Beyond Black-Scholes: Implied Volatility Smile (Priority MSFE)
IEOR E4734 Foreign Exchange & Related Derivatives (1st Half; 1.5 credits)
IEOR E4900 Master's Research or Project
IEOR E4999 Fieldwork (1-1.5 credits)

SPRING 2020 MSBA ELECTIVES

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Business School (MSE & MSBA students register via [BOSS](#); DROM Section 060 and 061 courses are by SSOL registration)
Also see: [Pre-Approved List of CBS Electives](#)

Choose at least two (2):

DROM B8108-060 Supply Chain Analytics
DROM B8110-060 Business Analytics Strategy
DROM B8110-061 Business Analytics Strategy
DROM B8116-060 Risk Management
DROM B8816-060 Quantitative Pricing & Revenue Analytics (1st Half; 1.5 credits)
MRKT B8607 Strategic Consumer Insights
MRKT B8623 Intro to Product Management (1.5 credits)*
MRKT B8649 Pricing Strategies (1.5 credits)
MRKT B8694 Building the Sales Machine
MRKT B8776 Foundations Of Innovation*
MRKT B9652 MS Marketing Models*
MRKT B9653 MS Machine Learning (1.5 credits)*
MRKT B9654 MS Artificial Intelligence (1.5 credits)*
MRKT B9XXX MS Digital Marketing*
XXXX Innovate Using Design Thinking (Blockweek)

MSBA students need **at least 12 credits** from the Business school

*dedicated MS/MSBA section
(The other courses are MSBA seats in an MBA class)

MS in Business Analytics

CSOR E4231 Analysis of Algorithms I
IEME E4200 Human-Centered Design & Innovation (Application by SSOL Waitlist)
IEOR E4008 Computational Discrete Optimization
IEOR E4312 Application of OR & AI Techniques in Marketing (1st Half; 1.5 credits)
IEOR E4405 Production Scheduling
IEOR E4418 Transportation Analytics & Logistics
IEOR E4507 Healthcare Operations Management
IEOR E4510 Project Management
IEOR E4521 Systems Engineering, Tools & Methods
IEOR E4525 Machine Learning FE & OR
IEOR E4526 Analytics on the Cloud
IEOR E4540 Data Mining for Engineers
IEOR E4561 Launch Your Startup: Tech (Co-Listed w. MGMT B8519-002)
IEOR E4570 Entrepreneurship Bootcamp for Engineers (Class: 1/24-1/26; 1.5 credits) (Application by SSOL Waitlist)
IEOR E4572 Visualization & Storytelling with Data (2nd Half; 1.5 credits)
IEOR E4573 Performance, Objectives & Results Using Data Analytics (1st Half; 1.5 credits)
IEOR E4575 Technology for Real Estate & The Built Environment (1st Half; 1.5 credits)
IEOR E4576 Advanced Financial Machine Learning: Factor Investing & Asset Allocation (1.5 credits)
IEOR E4601 Dynamic Pricing & Revenue Management
IEOR E4602 Quantitative Risk Management
IEOR E4630 Asset Allocation
IEOR E4700 Intro to Financial Engineering
IEOR E4718 Beyond Black-Scholes: Implied Volatility Smile (Priority MSFE)
IEOR E4733 Algorithmic Trading (Priority MSFE)
IEOR E4734 Foreign Exchange & Related Derivatives (1st Half; 1.5 credits)
IEOR E4742 Deep Learning (Priority MSFE)
IEOR E4900 Master's Research or Project
IEOR E4998 Managing Technological Innovation
IEOR E4999 Fieldwork (1-1.5 credits)
FINC B8307-060 Advanced Corporate Finance