FALL 2019 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 (info@ieor.columbia.edu). Include the course title, description and syllabus in your email. Courses below 4000-level (i.e. 3000, 2000, 1000 levels) are not permissible and do not count towards the MS degree.

MS in Industrial Engineering
IEOR E4207 Human Factors: Performance
IEME E4310 The Manufacturing Enterprise
IEOR E4403 Quantitative Corporate Finance (or IEOR E4578 Corporate Finance, Accounting & Investment Banking; may not take both)
IEOR E4404 Simulation
IEOR E4407 Game Theoretic Models of Operations
IEOR E4500 Applications Programming for FE (registration opens in August; priority to MSFE)
IEOR E4501 Tools for Analytics (waitlist approval; priority registration to MSBA first years)
IEOR E4506 Designing Digital Operating Models
IEOR E4520 Applied Systems Engineering
IEOR E4523-003 Data Analytics (waitlist approval; priority registration to MSBA first years)
IEOR E4525 Machine Learning for Financial Engineering & Operations Research
IEOR E4540 Data Mining for Engineers
IEOR E4550 Entrepreneurial Business Creation for Engineers
IEOR E4570 Entrepreneurship Bootcamp for Engineers (1.5 credits; waitlist approval)
IEOR E4571 Personalization: Theory & Application
IEOR E4576 Derivatives Marketing & Structuring (First Half Term – 1.5 credits)
IEOR E4620 Pricing Models for Financial Engineering
IEOR E4650 Business Analytics (2 sections)
IEOR E4700 Introduction to Financial Engineering
IEOR E4711 Global Capital Markets
IEOR E4722 Stochastic Control & Financial Applications
IEOR E4726 Applied Financial Risk Management
IEOR E4729 Model Based Trading
IEOR E4731 Credit Risk & Credit Derivatives
IEOR E4732 Computational Methods in Finance
IEOR E4735 Structured & Hybrid Products
IEOR E4742 Deep Learning for OR & FE
IEOR E4998 Managing Technological Innovations
IEOR E4999 Fieldwork

IEOR Doctoral Courses (please consult with your faculty advisor)
IEOR E6613 Optimization 1
IEOR E6711 Stochastic Modeling 1
IEOR E8100-001 PhD Seminar on Queuing Theory
IEOR E8100-002 Big Data & Machine Learning
IEOR E8100-003 Integer Programming
IEOR E8100-004 Prescriptive Analytics

Business School (register via cross-registration)
See: Pre-Approved List of CBS Electives

*DROM Section 060/061 will be listed shortly (priority registration to MSE and MSBA students)
FALL 2019 MSOR ELECTIVES

READ CAREFULLY: The courses listed below are approved electives for MSOR students. If a course of your interest is not listed, you must obtain written approval from an advisor (info@ieor.columbia.edu). Include the course title, description and syllabus in your email. Courses below 4000-level (i.e. 3000, 2000, 1000 levels) are not permissible and do not count towards the MS degree.

MS in Operations Research

IEOR E4108 Supply Chain Management & Design [Cancelled, will be offered Spring 2020]
IEOR E4207 Human Factors: Performance
IEME E4310 The Manufacturing Enterprise
IEOR E4403 Quantitative Corporate Finance (or IEOR E4578 Corporate Finance, Accounting & Investment Banking; may not take both)
IEOR E4407 Game Theoretic Models of Operations
IEOR E4500 Applications Programming for FE (registration opens in August; priority to MSFE)
IEOR E4501 Tools for Analytics (waitlist approval; priority registration to MSBA first years)
IEOR E4506 Designing Digital Operating Models
IEOR E4520 Applied Systems Engineering
IEOR E4523-003 Data Analytics (waitlist approval)
IEOR E4525 Machine Learning for Financial Engineering & Operations Research
IEOR E4540 Data Mining for Engineers
IEOR E4550 Entrepreneurial Business Creation for Engineers
IEOR E4570 Entrepreneurship Bootcamp for Engineers (1.5 credits; waitlist approval)
IEOR E4571 Personalization: Theory & Application
IEOR E4576 Derivatives Marketing & Structuring (First Half Term – 1.5 credits)
IEOR E4620 Pricing Models for Financial Engineering
IEOR E4650 Business Analytics (2 sections)
IEOR E4700 Introduction to Financial Engineering
IEOR E4710 Fixed Income & Term Structure Modeling
IEOR E4711 Global Capital Markets
IEOR E4722 Stochastic Control & Financial Applications
IEOR E4726 Applied Financial Risk Management
IEOR E4729 Model Based Trading
IEOR E4731 Credit Risk & Credit Derivatives
IEOR E4732 Computational Methods in Finance
IEOR E4735 Structured & Hybrid Products
IEOR E4742 Deep Learning for OR & FE
IEOR E4998 Managing Technological Innovations
IEOR E4999 Fieldwork

IEOR Doctoral Courses (please consult with your faculty advisor)

IEOR E6613 Optimization 1
IEOR E6617 Machine Learning and High-Dimensional Data Analysis in OR
IEOR E6711 Stochastic Modeling 1
IEOR E8100-001 PhD Seminar on Queuing Theory
IEOR E8100-003 Integer Programming
IEOR E8100-004 Prescriptive Analytics

Business School (register via cross-registration)
See: Pre-Approved List of CBS Electives
**READ CAREFULLY:** The courses listed below are approved electives for MSFE students. If a course of your interest is not listed, you must obtain written approval from an advisor (info@ieor.columbia.edu). Include the course title, description and syllabus in your email. Courses below 4000-level (i.e. 3000, 2000, 1000 levels) are not permissible and do not count towards the MS degree.

**MS in Financial Engineering Summer Electives**
- IEOR E4721 Financial Correlations – Modeling, Trading, Risk Management and AI, Class 5/28-7/12
- IEOR E4722 Modeling and Market-Making in Foreign Exchange (1.5 credits), Class 5/29-7/10 [Cancelled]
- **IEOR E4723 Alternative Investments** (1.5 credits), Class 6/3-7/15

**MS in Financial Engineering Fall Electives**
- IEOR E4403 Quantitative Corporate Finance (or IEOR E4578 Corporate Finance, Accounting & Investment Banking; may not take both)
- IEOR E4500 Applications Programming for FE
- IEOR E4525 Machine Learning for Financial Engineering & Operations Research
- IEOR E4710 Fixed Income & Term Structure Modeling
- IEOR E4722 Stochastic Control & Financial Applications
- IEOR E4726 Applied Financial Risk Management
- IEOR E4727 Programming for Financial Engineering
- IEOR E4729 Model Based Trading
- IEOR E4731 Credit Risk & Credit Derivatives
- IEOR E4732 Computational Methods in Finance
- IEOR E4735 Structured & Hybrid Products
- IEOR E4742 Deep Learning for OR & FE
- **IEOR E4999 Fieldwork**

**IEOR Doctoral Courses** (please consult with your faculty advisor)
- IEOR E6613 Optimization 1
- IEOR E6617 Machine Learning and High-Dimensional Data Analysis in OR
- IEOR E6711 Stochastic Modeling 1
- IEOR E8100-001 PhD Seminar on Queuing Theory
- IEOR E8100-003 Integer Programming
- IEOR E8100-004 Prescriptive Analytics
FALL 2019 MS&E ELECTIVES

READ CAREFULLY: The courses listed below are approved electives for MS&E students. If a course of your interest is not listed, you must obtain written approval from an advisor (info@ieor.columbia.edu). Include the course title, description and syllabus in your email. Courses below 4000-level (i.e. 3000, 2000, 1000 levels) are not permissible and do not count towards the MS degree.

Decision, Risk and Operations Electives (9 credits total)
IEOR E4650 Business Analytics (2 sections)
DROM Section 060/061 will be listed shortly
MBA & eMBA courses registration via BOSS (see: Pre-Approved List of CBS Electives)

Analysis Electives (at least 3 credits; 9 credits total for Management & Analysis)
IEOR E4108 Supply Chain Management & Design [Cancelled, will be offered Spring 2020]
IEOR E4403 Quantitative Corporate Finance (or IEOR E4578 Corporate Finance, Accounting & Investment Banking; may not take both)
IEOR E4407 Game Theoretic Models of Operations
IEOR E4501 Tools for Analytics (waitlist approval; priority registration to MSBA first years)
IEOR E4520 Applied Systems Engineering
IEOR E4523-003 Data Analytics (waitlist approval)
IEOR E4525 Machine Learning for Financial Engineering & Operations Research
IEOR E4540 Data Mining for Engineers
IEOR E4742 Deep Learning for OR & FE

Management Electives (at least 3 credits; 9 credits total for Management & Analysis)
IEME E4310 The Manufacturing Enterprise
IEOR E4506 Designing Digital Operating Models
IEOR E4550 Entrepreneurial Business Creation for Engineers
IEOR E4570 Entrepreneurship Bootcamp for Engineers (1.5 credits; waitlist approval)
IEOR E4711 Global Capital Markets
IEOR E4998 Managing Technological Innovations

Breadth Electives (6 credits total)
IEOR E4207 Human Factors: Performance
IEOR E4500 Applications Programming for FE (registration opens in August; priority to MSFE)
IEOR E4571 Personalization: Theory & Application
IEOR E4576 Derivatives Marketing & Structuring (First Half Term – 1.5 credits)
IEOR E4620 Pricing Models for Financial Engineering
IEOR E4700 Introduction to Financial Engineering
IEOR E4722 Stochastic Control & Financial Applications
IEOR E4726 Applied Financial Risk Management
IEOR E4729 Model Based Trading
IEOR E4731 Credit Risk & Credit Derivatives
IEOR E4732 Computational Methods in Finance
IEOR E4735 Structured & Hybrid Products
IEOR E4999 Fieldwork

IEOR Doctoral Courses (please consult with your faculty advisor)
IEOR E6613 Optimization 1
IEOR E6617 Machine Learning and High-Dimensional Data Analysis in OR
IEOR E6711 Stochastic Modeling 1
IEOR E8100-001 PhD Seminar on Queuing Theory
IEOR E8100-003 Integer Programming
IEOR E8100-004 Prescriptive Analytics
FALL 2019 MSBA ELECTIVES

READ CAREFULLY: The courses listed below are approved electives for MSBA students. If a course of your interest is not listed, you must obtain written approval from an advisor (info@ieor.columbia.edu). Include the course title, description and syllabus in your email. Courses below 4000-level (i.e. 3000, 2000, 1000 levels) are not permissible and do not count towards the MS degree.

MS in Business Analytics
IEOR E4108 Supply Chain Management & Design  
IEOR E4207 Human Factors: Performance  
IEME E4310 The Manufacturing Enterprise  
IEOR E4403 Quantitative Corporate Finance (or IEOR E4578 Corporate Finance, Accounting & Investment Banking; may not take both)  
IEOR E4407 Game Theoretic Models of Operations  
IEOR E4500 Applications Programming for FE (registration opens in August; priority to MSFE)  
IEOR E4506 Designing Digital Operating Models  
IEOR E4520 Applied Systems Engineering  
IEOR E4525 Machine Learning for Financial Engineering & Operations Research  
IEOR E4540 Data Mining for Engineers  
IEOR E4550 Entrepreneurial Business Creation for Engineers  
IEOR E4570 Entrepreneurship Bootcamp for Engineers (1.5 credits; waitlist approval)  
IEOR E4571 Personalization: Theory & Application  
IEOR E4576 Derivatives Marketing & Structuring (First Half Term – 1.5 credits)  
IEOR E4620 Pricing Models for Financial Engineering  
IEOR E4700 Introduction to Financial Engineering  
IEOR E4711 Global Capital Markets  
IEOR E4722 Stochastic Control & Financial Applications  
IEOR E4726 Applied Financial Risk Management  
IEOR E4729 Model Based Trading  
IEOR E4731 Credit Risk & Credit Derivatives  
IEOR E4732 Computational Methods in Finance  
IEOR E4735 Structured & Hybrid Products  
IEOR E4742 Deep Learning for OR & FE  
IEOR E4998 Managing Technological Innovations  
IEOR E4999 Fieldwork

IEOR Doctoral Courses (please consult with your faculty advisor)
IEOR E6613 Optimization 1  
IEOR E6617 Machine Learning and High-Dimensional Data Analysis in OR  
IEOR E6711 Stochastic Modeling 1  
IEOR E8100-001 PhD Seminar on Queueing Theory  
IEOR E8100-003 Integer Programming  
IEOR E8100-004 Prescriptive Analytics

Business School (MSE & MSBA students register via BOSS)  
See: Pre-Approved List of CBS Electives

*DROM Section 060/061 will be listed shortly