



Department of Industrial Engineering and Operations Research

**IEOR DEPARTMENT**  
**GRADUATE STUDENT HANDBOOK**

**SCHOOL OF ENGINEERING AND APPLIED SCIENCE**  
**COLUMBIA UNIVERSITY**

**Version 2**

**Updated January 14, 2009**



Table of Contents

- 1. Welcome to the IEOR Department ..... 4
- 2. Mission, History & Vision ..... 4
  - 2.1. Mission of Columbia University ..... 4
  - 2.2. Mission of School of Engineering and Applied Science..... 4
  - 2.3. History of the IEOR Department ..... 4
  - 2.4. Vision of the IEOR Department..... 5
- 3. Faculty and Professional Staff ..... 5
  - 3.1. Faculty ..... 5
  - 3.2. Professional Staff ..... 13
- 4. Graduate Student Responsibilities ..... 16
- 5. Computing ..... 17
  - 5.1. Email ..... 17
  - 5.2. IEOR Computer Lab and Electronic Classroom ..... 17
- 6. Academic Planning, Procedures and Policies ..... 18
  - 6.1. Master of Science Degree ..... 18
  - 6.2. Master of Science Degree Requirements ..... 18
  - 6.3. English Proficiency ..... 18
  - 6.4. Academic Advising ..... 19
  - 6.5. Academic Calendar ..... 20
  - 6.6. Registration ..... 20
  - 6.7. Waivers/Transfer Credits ..... 20
  - 6.8. Graduation ..... 20
  - 6.9. Official Letters and Transcripts ..... 21
- 7. Master of Science in Engineering Management Systems ..... 22
  - 7.1. Requirements ..... 22
  - 7.2. Semi-Core ..... 22
  - 7.3. Electives ..... 23
- 8. Master of Science in Financial Engineering ..... 24
  - 8.1. MSFE Curriculum (2008-2009) ..... 24
- 9. Master of Science in Industrial Engineering ..... 26
- 10. Master of Science in Operations Research..... 27
- 11. Joint Master of Science and Master of Business Administration ..... 29
- 12. Professional Degree in Industrial Engineering..... 30
- 13. International Students ..... 31
  - 13.1. Maintaining Lawful F-1 Status..... 31
  - 13.2. Work Eligibility for F-1 Students..... 32
- 14. Professional Development ..... 34
  - 14.1. Center for Career Education ..... 34
  - 14.2. IEOR Resume Portfolios ..... 34
  - 14.3. Internships ..... 34
  - 14.4. Internship for Academic Credit..... 35



14.5.	Research with Faculty.....	36
14.6.	Course Assistantships.....	36
15.	Location & Contact Information.....	37
15.1.	Location.....	37
15.2.	Contact Information .....	37



## 1. Welcome to the IEOR Department

Welcome to the graduate programs of the Industrial Engineering and Operations Research (IEOR) Department at Columbia University. You are about to embark on an academic and professional journey. This Handbook is available to assist you in navigating and planning your studies.

## 2. Mission, History & Vision

### 2.1. Mission of Columbia University

Columbia University is among the world's most distinguished research and education facility for students, scholars and professionals. The University recognizes the importance of its location in New York City and seeks to link its research and teaching to the vast resources of a great metropolis. It seeks to attract a diverse and international faculty and student body, to support research and teaching on global issues, and to create academic relationships with many countries and regions. It expects all areas of the university to advance knowledge and learning at the highest level and to convey the products of its efforts to the world.

### 2.2. Mission of School of Engineering and Applied Science

The Fu Foundation School of Engineering and Applied Science, as a part of the world-class teaching and research university, strives to provide the best in both undergraduate and graduate education. We are preparing engineering leaders who will solve the problems of the new century, fostering scientific inquiry but never losing sight of its human implications. The School's programs are designed to produce well-educated engineers who can put their knowledge to work for society. This broad educational thrust takes advantage of the School's links to a great liberal arts college and to distinguished graduate programs in law, business, and medicine. Through a synergy of teaching and research, we seek to educate a distinguished cadre of leaders in engineering and applied science, who will thrive in an atmosphere of recently emerging technologies.

### 2.3. History of the IEOR Department

The Department was first established in year 1919, when Industrial Engineering programs started at Columbia; the first class graduated in 1922. Operations Research courses have been offered at Columbia since 1952. Today, the Department is the home to four disciplines including Engineering Management Systems, Financial Engineering, Industrial Engineering, and Operations Research.



### 2.4. Vision of the IEOR Department

Our vision is that the Industrial Engineering and Operations Research Department (IEOR) of Columbia University is to become a world class organization of prominent research, education, and collaboration that produces, attracts and retains industry leaders, decision makers, and researchers in the fields of Engineering Management, Financial Engineering, Industrial Engineering, and Operations Research.

## 3. Faculty and Professional Staff

### 3.1. Faculty

The IEOR Department is comprised of full time and adjunct faculty. For a complete list of faculty members, please visit the Departmental website at: [www.ieor.columbia.edu/directory/faculty.html](http://www.ieor.columbia.edu/directory/faculty.html).

The Department's full time faculty members are:

#### **Daniel Bienstock**

##### **Professor**

##### **Computational Optimization Research Center Director**

[dano@ieor.columbia.edu](mailto:dano@ieor.columbia.edu)

Professor Daniel Bienstock first joined Columbia University's Industrial Engineering and Operations Research Department in 1989. Professor Bienstock teaches courses on integer programming and optimization. Before joining Columbia University, Professor Bienstock was involved in Combinatorics and Optimization Research at Bellcore. He has also participated in collaborative research with Bell Laboratories (Lucent), AT&T Laboratories, Tellium, Inc. and Lincoln Laboratory on various network design problems. Professor Bienstock's teaching and research interests include combinatorial optimization and integer programming, parallel computing and applications to networking. Professor Bienstock has published in journals such as Math Programming, SIAM and Math of OR.

#### **Jose Blanchet**

##### **Assistant Professor**

[Jose.blanchet@columbia.edu](mailto:Jose.blanchet@columbia.edu)

Professor Jose Blanchet joins the IEOR Department as of Spring 2008 and will be teaching IEOR E4404: Simulation and IEOR E4602: Quantitative Risk Management. His research interest includes applied probability, computational finance, MCMC, queueing theory, Rare-event analysis, Simulation methodology, and Risk theory. Professor Blanchet received his bachelor degree from Instituto Tecnológico Autónomo de México for Applied Mathematics and Actuarial Science and his masters and Ph.D. from Stanford University for Operations Research. Previously he has taught in Harvard University.



### **Mark Broadie**

#### **Carson Family Professor of Business**

[mnb2@columbia.edu](mailto:mnb2@columbia.edu)

Professor Mark Broadie joined Columbia University's Industrial Engineering and Operations Research Department in 1983. His main research areas include the pricing of derivative securities, risk management, and portfolio optimization. Much of his research focuses on the design and analysis of efficient numerical methods, including Monte Carlo methods, for the pricing and risk management of financial instruments. Professor Broadie is editor-in-chief of the *Journal of Computational Finance* and serves as associate editor for *Operations Research* and *Computational Management Science*. Professor Broadie teaches the elective course *Security Pricing: Models and Computation*. He also teaches doctoral courses in *Computational Finance* and *Computing for Business Research*. Professor Broadie has given seminars and courses worldwide and has done extensive consulting for financial firms. Previously he was a vice president at Lehman Brothers in their fixed-income research group.

### **Maria Chudnovsky**

#### **Associate Professor**

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Maria Chudnovsky joined the IEOR department at Columbia University in 2006. She received her undergraduate degree and Master of Science from the Technion-Israeli Institute of Technology, and a PhD from Princeton University in 2003. Currently she is a Clay Mathematics Institute research fellow. Her research interests are in graph theory and combinatorial optimization. Recently she was a part of a team of four researchers that proved the Strong Perfect Graph Theorem, a forty year old conjecture that had been a well known open problem in both graph theory and combinatorial optimization. For this work, she was awarded the Ostrowski foundation research stipend. In 2004 she was named one of the "brilliant ten" young scientists by the *Popular Science* magazine.

### **Rama Cont**

#### **Associate Professor**

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Rama Cont joined Columbia University's IEOR Department in 2006, after previous positions as CNRS research scientist at Centre de Mathématiques Appliquées, Ecole Polytechnique (France), and visiting professor at Princeton University. His research currently focuses on stochastic modeling and computational methods in finance, inverse problems and model uncertainty, random graphs and social networks. Rama has taught courses at various academic institutions in Europe and the U.S. including: Ecole Polytechnique; Université de Paris VI, Sorbonne; Princeton; Osaka University; Université Paris-Dauphine; and HEC. He has also worked as a consultant for several financial institutions on topics ranging from the optimal design of maritime transport contracts to numerical methods for pricing exotic options and is the founding director of *Frontiers in Finance*, an association aimed at the dissemination of quantitative techniques in risk management. He is the coauthor of *Financial Modelling* with



Jump Processes (CRC Press 2003) and Credit Derivatives and Structured Credit (Wiley 2005). He is a member of the Columbia Center for Applied Probability, SIAM, and INFORMS.

**Emanuel Derman**

**Professor**

**Director of MS Program in Financial Engineering**

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Professor Emanuel Derman joined Columbia University's Industrial Engineering and Operations Research Department in 2003. Prior to joining Columbia, he was a Managing Director at Goldman, Sachs & Co, where he was head of the Quantitative Strategies group in the equities division, and then head of Quantitative Risk Strategies in firm wide risk. He is best known for his work on the Black-Derman-Toy interest-rate model and for developing local volatility models of the implied volatility smile. He was the IAFE/Sungard Financial Engineer of the Year in 2000. Professor Derman's research interests include quantitative finance, financial engineering, derivatives valuation, volatility models and risk management. He has published in numerous journals including the Financial Analysts Journal, RISK, The Journal of Portfolio Management, and The Journal of Derivatives. His recent memoir, "My Life as a Quant: Reflections on Physics and Finance", was published in 2004 and was selected as one of Business Week's Top Ten Books of the Year.

**Guillermo Gallego**

**Professor**

[gmg2@columbia.edu](mailto:gmg2@columbia.edu)

Professor Guillermo Gallego joined Columbia University's Industrial Engineering and Operations Research Department in 1988 where he has been conducting research in the areas of Inventory Theory, Supply Chain Management, Revenue Management and semi-conductor manufacturing. His work has been supported by numerous Industrial and Government grants. Professor Gallego has published influential papers in the leading journals of his field where he has also occupied a variety of editorial positions. Professor Gallego has consulted for large corporations such as IBM, Lucent, and Northwest Airlines, and government agencies such as the National Research Council and the National Science Foundation. His graduate students are associated with prestigious universities. He spent his 1996-97 sabbatical at Stanford University and was a visiting scientist at the IBM Watson Research Center from 1999-2003. He was the Chairman of the IEOR Department from July 2002 to June 2008.

**Paul Glasserman**

**Jack R. Anderson Professor of Business**

**Senior Vice Dean, Columbia Business School**

[pg20@columbia.edu](mailto:pg20@columbia.edu)

Professor Paul Glasserman joined Columbia University in 1991. Prior to joining Columbia, Paul Glasserman was with Bell Laboratories. He has also been a visiting professor at Princeton. Professor Glasserman's research and teaching address risk management, the pricing of derivative



securities, Monte Carlo simulation, statistics and operations. Professor Glasserman is a recipient of the Wilmott Award for Cutting-Edge Research in Quantitative Finance, a fellowship from the FDIC Center for Financial Research, a National Young Investigator Award from the NSF, a University Partnership Award from IBM, the Outstanding Simulation Publication Award from the Institute of Management Science, and the Erlang Prize in applied probability from INFORMS. He is also a two-time recipient of the Dean's Award for Teaching Excellence. He serves as associate editor of *Finance & Stochastics*, *Mathematical Finance*, the *Annals of Applied Probability*, and the *Journal of Computational Finance*. He is a member of the Education and Standards Committee of PRMIA, the Professional Risk Managers International Association. He has also served as a consultant to industrial corporations, management consulting and financial firms.

### **Donald Goldfarb**

#### **Alexander and Hermine Avanesians Professor**

[gold@ieor.columbia.edu](mailto:gold@ieor.columbia.edu)

A member of Columbia University's Industrial Engineering and Operations Research Department since 1982, Professor Goldfarb served as Chair of the Department from 1984-2002. In addition, in 1994-95, he served as Acting Dean of the School of Engineering and Applied Science. Before coming to Columbia, Professor Goldfarb held positions as Professor and Acting Chair in the Computer Science Department at the City College of New York, Visiting Professor in the Department of Computer Science and School of Operations Research and Industrial Engineering at Cornell University and Assistant Research Scientist at the Courant Institute of Mathematical Sciences of New York University. Professor Goldfarb's teaching and research interests include algorithms for linear, quadratic, semidefinite, second-order cone and general nonlinear programming, network flows, large sparse systems, and applications in robust optimization, finance and imaging. Professor Goldfarb has published approximately seventy technical papers and has served on the editorial boards of several journals including Editor-in-Chief of *Mathematical Programming*, Editor of the *SIAM Journal on Optimization* and the *SIAM Journal on Numerical Analysis*, and Associate Editor of *Operations Research* and *Mathematics of Computation*. He has been a member of the Councils of the Mathematical Programming Society and the American Mathematical Society, numerous technical society program and award committees, and advisory committees to various universities and government research agencies. The 1995 recipient of the Institute for Operations Research and Management Sciences Prize for Research Excellence in the Interface between Operations Research and Computer Science, Professor Goldfarb also received honorable mention for the 1996 SIAM Optimization Prize and was honored with the 1999 Great Teachers Award from the Society of Columbia Graduates.

### **Woonghee Tim Huh**

#### **Associate Professor**

[huh@ieor.columbia.edu](mailto:huh@ieor.columbia.edu)

Professor Woonghee Tim Huh joined the Department of Industrial Engineering and Operations Research in 2003, after completing his doctoral research on strategic capacity planning in the



semiconductor industry. His current research interests also include pricing and inventory control, supply chain management, and auction-theoretic models. Dr. Huh is the recipient of a number of awards including: Kuhn Award from Naval Research Logistics (2007), SEAS Diversity Teaching Award (2006) and Distinguished Teaching Award (2005).

### **Garud Iyengar**

**Associate Professor**

**Director of Undergraduate Programs**

[garud@ieor.columbia.edu](mailto:garud@ieor.columbia.edu)

Professor Garud Iyengar joined Columbia University's Industrial Engineering and Operations Research Department in 1998. Professor Iyengar teaches courses in simulation and optimization. Professor Garud Iyengar's research interests include convex optimization, robust optimization, queuing networks, combinatorial optimization, mathematical and computational finance, communication and information theory. He has published in numerous journals including IEEE Transactions on Information Theory, Mathematics of Operations Research, Mathematical Programming, IEEE Transactions on Signal Processing, and IEEE Transactions on Communication Theory.

### **Soulaymane Kachani**

**Associate Professor**

**Director of MS Programs in EMS, IE and OR**

**Columbia University Senator (2004-06)**

**Member, Executive Committee & the Budget Review Committee of the Senate (2004-06)**

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Professor Kachani is conducting research in the fields of dynamic pricing, logistics, supply chain management, and transportation analysis. He teaches courses at the undergraduate and graduate levels in the areas of logistics, industrial economics, and corporate economics. Prior to joining Columbia, Professor Kachani worked as an Associate and a Senior Associate in the Boston Office of McKinsey & Company. Dr. Kachani is the recipient of a number of awards including: Kim Award for Faculty Involvement (2007) and Distinguished Teaching Award (2005).

### **Steven Kou**

**Professor**

[kou@ieor.columbia.edu](mailto:kou@ieor.columbia.edu)

Professor Steven Kou joined Columbia University's Industrial Engineering and Operations Research Department in 1998, and he teaches courses in financial engineering, stochastic models, and probability and statistics. Prior to joining Columbia, Professor Kou was an assistant professor in the department of statistics at the University of Michigan. Professor Kou's research interests include mathematical and computational finance, and applied probability. He has published in numerous journals including Management Science, Mathematical Finance, Advances in Applied Probability, Annals of Applied Probability, Statistica Sinica, and Finance and Stochastics. In terms of financial engineering, professor Kou is well-known for his research



on the double exponential jump diffusion model, models for growth stocks, the numerical pricing of discrete path-dependent options, market LIBOR models with jump risk, and option pricing in incomplete markets. His results have been widely used on Wall Street, and have been incorporated into standard MBA textbooks, such as the textbook, Fundamentals of Futures and Options Markets by John Hull.

### **Mariana Olvera-Cravioto**

#### **Assistant Professor**

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Dr. Olvera-Cravioto was born and raised in Mexico City. She earned her undergraduate degree in Applied Mathematics from ITAM (Instituto Tecnológico Autónomo de México), Master of Science in Statistics from Stanford University, and PhD from the Department of Management Science and Engineering at Stanford University. Together with her dissertation advisor, Dr. Peter W. Glynn, she conducted research on single server queues with heavy-tailed processing times. Dr. Olvera-Cravioto's research interests are mostly in Applied Probability, in particular, Stochastic Systems, Queueing Theory, Heavy-tailed Distributions, Simulation, and Inventory Control.

### **Özalp Özer**

#### **Associate Professor**

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Özalp Özer is an Associate Professor of Industrial Engineering & Operations Research at Columbia University. Previously he was a faculty member at the department of Management Science and Engineering at Stanford University. His general research interest is to investigate the impact of technology and information on new product development, production, marketing and distribution of goods and services, management and coordination of supply chains, and pricing management. He has received the Wickham Skinner Early-Career Research Accomplishment Award from the Production and Operations Management Society in 2004, and the Eugene Grant Teaching Award at Stanford by vote of students in 2003 and 2004. His articles have appeared in journals such as Management Science, Operations Research, and Manufacturing & Service Operations Management. He is currently serving as an associate editor for Operations Research and a senior editor for Production and Operations Management. He is an active consultant to industry and has consulted companies such as Ericsson, General Motors, Hitachi GST, and HP. He received his Ph.D. and M.S. degrees from Columbia University.

### **Jay Sethuraman**

#### **Associate Professor**

[jay@ieor.columbia.edu](mailto:jay@ieor.columbia.edu)

Jay Sethuraman joined Columbia University's Department of Industrial Engineering and Operations Research Department in 1999. His research interests are in the areas of scheduling, discrete optimization and its applications, and applied probability.



### **Karl Sigman**

#### **Professor**

#### **Director, Center for Applied Probability (CAP)**

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Professor Karl Sigman joined Columbia University's Industrial Engineering and Operations Research Department in 1987. Professor Sigman was the recipient of the Distinguished Faculty Teaching Award both in 1998 and in 2002. He teaches courses in stochastic models, financial engineering and queueing theory. Before joining Columbia, Professor Sigman was a postdoctoral associate at the Mathematical Sciences Institute at Cornell University. Professor Karl Sigman's research interests include queueing theory, stochastic networks, point processes, insurance risk, and economics. He has published in numerous journals including Stochastic Processes and Their Applications, Queueing Systems, Journal of Applied Probability, and Mathematics of Operations Research.

### **Clifford Stein**

#### **Professor**

#### **Department Chairman**

[cliff@ieor.columbia.edu](mailto:cliff@ieor.columbia.edu)

Professor Clifford Stein joined Columbia University's Industrial Engineering and Operations Research Department in 2001, where he has been conducting research in the areas of Combinatorial Optimization, Scheduling and Network Algorithms. Prior to joining Columbia, he spent 9 years as an Assistant and Associate Professor in the Dartmouth College Department of Computer Science. Professor Stein has published many influential papers in the leading conferences and journals in his field, and has occupied a variety of editorial positions. His work has been supported by the National Science Foundation and Sloan Foundation. He is the winner of several prestigious awards including an NSF Career Award, an Alfred Sloan Research Fellowship and the Karen Wetterhahn Award for Distinguished Creative or Scholarly Achievement. He is also the co-author of the textbook "Introduction to Algorithms," with T. Cormen, C. Leiserson and R. Rivest. This book is currently the best-selling textbook in algorithms and has been translated into 8 languages. Professor Stein was elected Chairman of the IEOR Department in July 2008.

### **Ward Whitt**

#### **Wai T. Chang Professor**

#### **Director of Doctoral Programs**

[Ward.whitt@columbia.edu](mailto:Ward.whitt@columbia.edu)

Professor Whitt joined Columbia University's IEOR Department in 2002, after spending 25 years in research at AT&T, first at Bell Labs and then at AT&T Labs, where he was a Technology Leader and an AT&T Fellow. At Columbia, Professor Whitt teaches courses on stochastic processes and their applications. Professor Whitt's research interests include stochastic processes, stochastic-process limits, queues, numerical transform inversion, telecommunication applications, and customer contact centers. He has over 250 research publications. In 1996 he was elected to the National Academy of Engineering.



**David D. Yao**

**Professor**

**Director of M.S. Programs (EMS, IE, OR)**

[yao@columbia.edu](mailto:yao@columbia.edu)

David Yao joined the IEOR Department in 1983, and became a full professor in 1988. He has been an IEEE Fellow, and a recipient of many awards, including the Outstanding Paper Prize (2003) from the Society for Industrial and Applied Mathematics, the Franz Edelman Award (1999) from the Institute for Operations Research and Management Sciences, the Outstanding Technical Achievement Award (1999) from IBM, the Guggenheim Fellowship (1991/92) from the Guggenheim Foundation, the Presidential Young Investigator Award (1987-92) from the National Science Foundation, and the George Nicholson Prize (1983) from the Operations Research Society of America. Author/co-author of over 160 refereed publications, three books and five edited volumes, he is the Stochastic Models Area Editor of Operations Research, and has served on the editorial board of several other leading journals. A principal investigator of over two dozen research grants and contracts, he has done extensive scientific and consulting work in semiconductor manufacturing, computer systems scheduling, Internet and web-server performance optimization, and supply chain management. He is a holder of four U.S. patents in manufacturing operations and supply-chain logistics.



### 3.2. Professional Staff

The IEOR Department has eight full time professional staff responsible for its daily operations and programming. Brief descriptions of their functions are found below.

**Adina Berrios Brooks**  
**Student Affairs Manager**

315 S. W. Mudd Building  
Phone: +1 212-854-1934  
Fax: +1 212-854-8103  
Email: [adina@ieor.columbia.edu](mailto:adina@ieor.columbia.edu)

Office hours: Mondays - Thursdays, 9:00 am – 5:00 pm; Fridays, 9:00 am - 12:30 pm.

Provides organization & leadership in graduate admissions, recruiting and marketing. Provides support for academic programs, career development, corporate affiliations, employer relations and alumni outreach. Advises BS (3-2 Combined Plan ECON-OR) and MS students.

**Maria Casuscelli**  
**Administrative Coordinator**

313 S. W. Mudd Building  
Phone: +1 212-854-8404  
Fax: +1 212-854-8103  
Email: [maria@ieor.columbia.edu](mailto:maria@ieor.columbia.edu)

Office hours: Mondays – Fridays, 9:00 am – 5:00pm.

Provides administrative support to the chairman and faculty; assists the chairman with the calendar; coordinates and oversees administrative processes behind faculty searches and tenure promotions; coordinates faculty and staff meetings; liaisons with University offices to bring visiting scholars on-board; manages classrooms and related resources; schedules classes with the director; orders textbooks, class resources and desk copies; liaises with the University bookstore.

**Ufei Chan**  
**Business Manager**

309 S. W. Mudd Building  
Phone: +1 212-854-1473  
Fax: +1 212-854-8103  
Email: [ufei@ieor.columbia.edu](mailto:ufei@ieor.columbia.edu)

Office hours: Mondays - Fridays, 9:00 am – 5:00 pm.



Provides management and oversight of Departmental financial operations including payroll, expenditures and budget; coordinates grant application with faculty; and oversees Departmental accounting and management of financial records.

### **Risa Cho**

#### **Academic Coordinator and Webmaster**

313 S. W. Mudd Building

Phone: +1 212-854-4351

Fax: +1 212-854-8103

Email: [risa@ieor.columbia.edu](mailto:risa@ieor.columbia.edu)

Office hours: Mondays - Fridays, 10:00 am – 6:00 pm.

Provides academic administrative support in course scheduling and registration, academic requirements, student record keeping, special events, correspondence and announcements; administers IEOR Web site.

### **Donella Crognach**

#### **Graduate Student Services Coordinator**

309 S. W. Mudd Building

Phone: +1 212-854-2942

Email: [dc2309@columbia.edu](mailto:dc2309@columbia.edu)

Office hours: Mondays – Thursdays, 9:00 am – 6:00 pm; Fridays, 3:00 pm – 6:00 pm.

Provides organization and support in doctoral student affairs including admissions, funding, academic progress, and record keeping; provides support in graduate admissions, vendor/catering services and special events.

### **Jenny S. Mak**

#### **Director, Administration, Academic & Professional Development**

313 S. W. Mudd Building

Phone: +1 212-854-0757

Fax: +1 212-854-8103

Email: [jenny@ieor.columbia.edu](mailto:jenny@ieor.columbia.edu)

Office hours: By appointment

Provides organization and leadership in administrative, financial and human resource operations, employer/industry outreach and relationships, academic advising and programs, programming development, professional and career development, and admissions; liaises and consults with university offices and agencies; and advises undergraduate and graduate students.



**Jaya Mohanty**

**Administrative & Financial Assistant**

309 S. W. Mudd Building

Phone: +1 212-854-1480

Fax: +1 212-854-8103

Email: [jaya@ieor.columbia.edu](mailto:jaya@ieor.columbia.edu)

Office hours: Mondays - Fridays, 9:00 am – 5:00 pm.

Processes purchase orders, travel reimbursements, payments to students, facilities requests; maintains departmental directory; handles in/outgoing mail.

**Michael Mostow**

**Systems Administrator**

323 S. W. Mudd Building

Phone: +1 212-854-2405

Email: [mikem@ieor.columbia.edu](mailto:mikem@ieor.columbia.edu)

Office hours: Mondays - Fridays, 9:00 am – 5:00 pm.

Provides organization and support in computer-related administration and procurement; administers departmental electronic equipment; and manages IEOR computer lab.



#### 4. Graduate Student Responsibilities

Being a graduate student involves more than completing coursework and other requirements. Becoming a graduate student involves<sup>1</sup>:

**Self Directedness:** In order to be a successful graduate student (and future professional) you must embrace and develop self-directedness. Self-directedness is when you can function and take primary responsibility and ownership for your learning and development. Taking ownership of your learning and development translates to engaging, belonging, identifying and practicing. As a member of the IEOR Department, you will find that some of your most valued learning experiences involve self-directed projects and peer/professional networking and collaborations.

**Possessing Professional Identity:** Enrolling in one of the graduate programs at IEOR means that you are on the road to becoming a professional and scholar. A professional is one that possesses skills, demonstrates competence, displays responsibility, develops cultural and social sensitivity and etiquettes, and adheres to ethical standards. Professionalism extends beyond the physical presence, but also the virtual including the various modes of communication (i.e. telephone, email/mail correspondence, text messages). The faculty, professional staff, fellow students and employers will be holding you to the strictest and highest level of professionalism.

**Developing a Collegial and Professional Network:** Your fellow classmates, faculty, and administration at Columbia University are part of your collegial and professional network. The Department urges you to develop this network as it will become a critical resource which offers you help on coursework, professional development and personal support. The Department urges you to develop your professional practice through collaboration and discussion.

**Upholding a High Standard of Academic Integrity:** The University expects you to uphold the highest integrity and take ownership of your own work. Intellectual integrity is the hallmark of educational institutions; academic dishonesty is one of the most serious offenses that a student can commit at Columbia. It is punishable by suspension or dismissal.

In making clear our policy on academic dishonesty, it is not feasible to include here all the various forms, as they are innumerable. It is useful, however, to list several obvious varieties in order to dispel confusion about actions that we will not tolerate:

1. Cheating on exams or assignments: copying work of another student, using textbooks, notes, and/or electronic devices that are not permissible during the exam;
2. Assisting another student in cheating;
3. Submitting essays, or portions of essays, written by other people as one's own;
4. Failing to acknowledge, through proper footnotes and bibliographic entries, the source of ideas essentially not one's own, including resources from the Internet;
5. Failing to indicate paraphrases or ideas or verbatim expressions not one's own through proper use of quotations and footnotes;

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<sup>1</sup>From Adult Learning & Leadership Advisement Guide, Teachers College, Columbia University.



6. Submitting written work for one course to a second course without having received prior permission from both instructors;
7. Collaborating on an assignment or examination without specific permission from the faculty member to do so;
8. Selling of notes, syllabi, or papers.

This list, of course, does not pretend to be definitive. Ignorance is no excuse for academic dishonesty. If questions arise concerning proper use of quotations, footnotes, bibliographies, or cheating, the student should contact the instructor. Seeking informed advice from a faculty member is the best way to avoid confusion about matters that can be complicated.

## 5. Computing

### 5.1. Email

Each member of the Columbia community is provided with an email account (i.e. [abc1234@columbia.edu](mailto:abc1234@columbia.edu)). The Department disseminates various news, events, and professional initiatives through the Columbia email system.

Students are expected to adhere to the Columbia Computer and Network Use Policy, as stated on the website: <https://www1.columbia.edu/sec/acis/manageaccount/agree1.html>.

The Department prohibits nuisance e-mail or other online messages such as chain letters, obscene, harassing, or other unwelcome messages.

### 5.2. IEOR Computer Lab and Electronic Classroom

Each registered IEOR graduate student is granted an IEOR Computer Lab Account. To activate the account, please follow the directions located on this website:

[http://www.ieor.columbia.edu/misc-pages/computer\\_lab.html](http://www.ieor.columbia.edu/misc-pages/computer_lab.html).

The Department asks all users of the IEOR Computer Lab and Electronic Classroom (Room 303 Mudd) **not to bring any food or drinks to the space**. Furthermore, the Department kindly asks all users to be mindful not to leave any garbage or unwanted materials behind.

The IEOR Computer Lab Account and the use of the IEOR Electronic classroom (Room 303 Mudd) is a privilege granted to you. **This privilege will be revoked if these policies are violated.**



## 6. Academic Planning, Procedures and Policies

### 6.1. Master of Science Degree

The Fu Foundation School of Engineering and Applied Science at Columbia University awards the Master of Science degrees. The Department offers the M.S. degree in the following four disciplines:

1. Engineering Management Systems
2. Financial Engineering
3. Industrial Engineering
4. Operations Research

The M.S. degrees are conferred in May, February and October.

### 6.2. Master of Science Degree Requirements

In order to earn a Master of Science degree in one of the four IEOR Departmental disciplines, the student must satisfy the following:

1. Uphold academic good standing, with a minimum grade point average of 2.5/4.0.
2. All courses taken with letter grading (i.e. A, B, C, D, no pass/fail courses).
3. Completed all courses at Columbia University.
4. For International students: achieve level 8 or higher on the English Proficiency Exam (see [section 6.3](#)).

For specific information, please refer to the SEAS Bulletin. In addition to the above requirements, each degree has specific requirements, as specified in each section (Section 8 – 12).

### 6.3. English Proficiency

Admitted graduate students who are required to submit official TOEFL results must attain levels of proficiency as described below. Students will not be cleared for graduation unless they satisfy the following requirements:

- M.S. and Professional Degree candidates must reach level 8 on the English Placement Test (EPT) offered by Columbia's American Language Program (ALP; [www.alp.columbia.edu](http://www.alp.columbia.edu)).
- Ph.D. candidates must attain level 10 on the English Placement Test (EPT) offered by Columbia's American Language Program (ALP; [www.alp.columbia.edu](http://www.alp.columbia.edu)).



The EPT is administered in two parts. Part I is a multiple-choice exam and Part II is an essay. Students are required to take both parts, and a level 8 must be scored on Part I in order to take Part II.

The EPT must be taken at Orientation (the fee for this administration of the exam will be covered by SEAS). A student who misses this administration of the EPT must take the exam at his or her own expense at the beginning of the first semester enrolled and submit the official score to the Graduate Student Services Office. (CVN students are exempt from the EPT.)

A student who does not pass the EPT at the required level of proficiency must retake it at his or her own expense until the required level of proficiency is achieved. The ALP may regulate how often the examination is taken.

It is strongly recommended that students enroll in an appropriate ALP course if they have not achieved the required proficiency after the first examination. For more information on the administration of the EPT, please contact the Graduate Student Services Office.

#### 6.4. Academic Advising

Each student is assigned to one academic advisor. Student must meet with his/her assigned advisor to discuss academic progress and course scheduling. Student's course schedule must be approved by his/her academic advisor. Taking courses without approval may jeopardize degree completion.

Prior to meeting with the academic advisor, the student should research the courses and schedule. The student should fill out a Student Information Sheet ([www.ieor.columbia.edu/pdf-files/Student\\_Info\\_Sheet.pdf](http://www.ieor.columbia.edu/pdf-files/Student_Info_Sheet.pdf)) prior to meeting with the advisor. The advisor will sign the sheet approving the course selection. The Student Information Sheet serves as a binding agreement between the student and advisor. Changes to the agreed upon schedule must be reviewed.

The table below indicates the academic advisors for each degree program.

Degree Program	Advisors
M.S. in Engineering Management System	Dr. Tim Huh Dr. Soulaymane Kachani Dr. Jay Sethuraman
M.S. in Financial Engineering	Dr. Daniel Bienstock Dr. Rama Cont Dr. Emanuel Derman Dr. Steven Kou
M.S. in Industrial Engineering	Dr. David Yao
M.S. in Operations Research	Dr. Maria Chudnovsky Dr. Tim Huh



Dr. Soulaymane Kachani  
Ms. Jenny Mak

### 6.5. Academic Calendar

The University calendar can be found on the Registrar's website:

<http://www.columbia.edu/cu/registrar/>

In general, the Fall term starts the day after Labor Day. The Spring term starts the day after Martin Luther King, Jr. Day. First day of classes during the Fall and Spring terms are on Tuesdays.

### 6.6. Registration

For specific policies regarding registration, visit the Registrar's website:

<http://www.columbia.edu/cu/registrar/docs/students/registration/index.html>

### 6.7. Waivers/Transfer Credits

All 30 credits for the MS in EMS, IE and OR, and the 36 credits for the MS in Financial Engineering must be completed at Columbia University.

Students may have taken similar courses in other institutions. A student may request a waiver of the requirement by submitting: (1) course description of the similar course; (2) syllabus; and (3) transcript indicating satisfactory performance.

If the course requirement is waived, the student needs to select an alternate 3-credit course and obtain approval from their advisor.

### 6.8. Graduation

Degrees are conferred in May, October and February. Students who finish their degree at the end of the Summer term obtain their degree in October. Students who finish their degree at the end of the Fall term obtain their degree in February.

To graduate, all students must complete the *Application for Degree or Certificate* and submit the printed form to 210 Kent Hall. The form may be printed from the following website:

<http://www.columbia.edu/cu/registrar/docs/forms/app-for-deg-or-cert.html>

University Commencement is held once per year in May. Graduates from the October and February conferrals are invited to participate.



## 6.9. Official Letters and Transcripts

Official letters from the Department can be requested from the Department for the following purposes:

- Confirmation of students' academic status, including ongoing and finished courses and expected diploma conferral.
- Extending students' visa status to continue required academic courses at Columbia University; this requires the approval from the faculty advisor or director.
- Approval letter for international students to get school credits for internships through Curricular Practical Training.
- Letters of invitation for family members, in need of visas, to attend Columbia University Commencement.

Should a student require such a letter, a formal request must be written to the IEOR Departmental Academic Staff: [info@ieor.columbia.edu](mailto:info@ieor.columbia.edu). Once approved, the letter will be ready within three (3) business days.

Please note that the Department does not issue official transcripts nor provide copies of previous transcripts submitted with your application. Official Columbia University transcripts can be ordered through the Office of the Registrar through SSOL (<https://ssol.columbia.edu/>) or in-person at the University Registrar's Office in 205 Kent Hall.



## 7. Master of Science in Engineering Management Systems

Master of Science program in Engineering Management Systems (EMS) provides students with a 30-point (33 points if no background in probability and statistics) that emphasizes both technology and management perspectives in solving problems, making decisions, and managing risks in complex systems. Students pursuing this degree program are provided with a rigorous exposure to deterministic optimization and stochastic modeling, a basic coverage of applications in the areas of operations engineering and management, and an in-depth coverage of applications.

Graduates from this program are expected to assume positions as business analysts in logistics, supply chain, revenue management, and consulting firms, and as financial analysts in risk-management departments of investment banks, hedge funds, and credit-card and insurance firms.

### 7.1 Requirements

IEOR E4004: Intro to OR: Deterministic Models

IEOR E4106: Intro to OR: Stochastic Models

IEOR E4XXX: Operations Consulting (new course starting Fall 2009)

*(SIEO W4150: Introduction to Probability and Statistics must be taken if student have not taken the equivalent previously)*

### 7.2 Semi-Core

#### Management Electives

At least 2 out of:

ECIE W4280: Corporate Finance

FINC B6302: Capital Markets & Investments

FINC B8301: Advanced Corporate Finance

IEME E4310: The Manufacturing Enterprise

IEOR E4201: Engineering of Management

IEOR E4202: Engineering of Management II

IEOR E4505: Operations Research in Public Policy

IEOR E4510: Project Management

IEOR E4550: Entrepreneurial Business Creation for Engineers

IEOR E4705: Studies in Operations Research

IEOR E4998: Managing Technological Innovation & Entrepreneurship



## Engineering/Technical Electives

At least 2 out of:

IEOR E4000: Production Management  
IEOR E4210: Supply Chain Management  
IEOR E4220: Demand and Supply Analytics  
IEOR E4403: Advanced Engineering & Corporate Economics  
IEOR E4404: Simulation  
IEOR E4405: Production Scheduling  
IEOR E4407: Game Theoretic Models of Operations  
IEOR E4418: Logistics and Transportation Management  
IEOR E4601: Dynamic Pricing and Revenue Optimization

### 7.3 Electives

The remaining electives can be selected from IEOR, SIPA, GSB, Economics, Mathematics and Statistics. At least 18 points out of 30 (or 33, if taking SIEO W4150) must be taken in IEOR.

*(starting at 2009-2010 academic year)*



## 8. Master of Science in Financial Engineering

Financial Engineering is a multidisciplinary field involving financial theory, the methods of engineering, the tools of mathematics and the practice of programming. The Financial Engineering Program at Columbia University provides a one-year full-time training in the application of engineering methodologies and quantitative methods to finance. It is designed for students who wish to obtain positions in the securities, banking, and financial management and consulting industries, or as quantitative analysts in corporate treasury and finance departments of general manufacturing and service firms.

The first half of our program is devoted to the tools of the trade and their use in modeling financial markets and instruments. Students take courses in stochastic processes, optimization, numerical techniques, Monte Carlo simulation, and data analysis. They also study portfolio theory, derivatives valuation, and financial risk analysis, making use of the methods they have learned.

The second half of the program gives students the opportunity to take more advanced courses or study specialized topics. We offer a selection of more detailed courses on current subjects of interest, ranging from models of the term structure of interest rates to a study of the implied volatility smile, as well as a course on applications programming for financial engineering. Students can also choose from a variety of courses on particular markets and their models, for example mortgage-backed securities or credit-risk modeling.

In addition to courses within the engineering school, students can also take electives from various schools within the university, such as the Graduate School of Business, the Graduate School of Arts and Sciences, the School of Law, and the School of International and Public Affairs.

Our program also hosts a popular Financial Engineering Practitioners Seminar on Monday nights, at which Wall Street and industry practitioners present seminars on their recent research or particular specialty, and where students can hear firsthand about life in the financial world.

### 8.1. MSFE Curriculum (2008-2009)

For the MSFE class of 2008-2009, the MSFE Program requires the completion of 36 points on a full time basis only. Students start with a 8 week part I summer session (July 7 - August 29, 2008), continues through the 2008-2009 academic year and ending with a 6 week Part II summer session (approximately May 26 - July 2, 2009). All courses are for 3 credits, unless stated otherwise.

#### Summer Part I: Required Core, 7.5 points

IEOR [E4701](#): Stochastic Models for Financial Engineering (*R. Cont*)

IEOR [E4702](#): Statistical Tools for Financial Engineering (*S. Kou*)

IEOR [E4799](#): Foundations of Finance (*S. Kou & L. Tilman*)



The Department requires that students achieve grades of B- or higher in each of the three fundamental core courses offered in the first summer. Poor performance in these courses is indicative of inadequate preparation and is very likely to lead to serious problems in completing the program. As a result, students failing to meet this criterion will be asked to withdraw from the program; however, students may transfer to other programs within the Department at the discretion of their academic adviser.

### **Fall: Required Core, 12 points**

IEOR E4007: Optimization Models and Methods for Financial Engineering (*G. Iyengar*)

IEOR E4703: Monte Carlo Simulation (*G. Iyengar*)

IEOR E4707: Financial Engineering: Continuous Time Models (*R. Cont*)

IEOR E4709: Data Analysis for Financial Engineering (*R. Cont*)

### **Spring: Electives** (*select at least 3 from the following*)

DRAN B8835: Security Pricing Models (*C. Moallemi*)

IEOR E4500: Applications Programming for Financial Engineering (*D. Bienstock*)

IEOR E4708: Seminar on Important Papers in Financial Engineering (*E. Derman*)

IEOR E4710: Term Structure Modeling (*S. Kou*)

IEOR E4718: Introduction to the Implied Volatility Smile (*E. Derman*)

IEOR E4726: Topics in Quantitative Finance: Experimental Finance (*M. Lipkin & A. Stanton*)

IEOR E4727: Topics in Quantitative Finance: Quantitative Portfolio Management (*A. Meucci*)

IEOR E4729: Topics in Quantitative Finance: Structured Products: Pricing Models and Risk Management (*L. Kani*)

IEOR E4731: Credit Risk and Credit Derivatives (*W. Morokoff*)

### **Summer Part II: Electives, 4.5 points**

The Department offers industry specific courses in Experimental Finance, Foreign Exchange and Related Derivative Instruments, Hedge Fund Management, Numerical Methods of PDE, Risk Management, etc. Specific offerings may vary each term.



## 9. Master of Science in Industrial Engineering

The Master of Science in Industrial Engineering program (30 points) is intended to enable students with engineering undergraduate degrees to enhance their training in special fields including production planning, inventory control, scheduling, and industrial economics.

MSIE degree candidates are required to satisfy a core program of graduate courses:

SIEO W4150: Introduction to Probability and Statistics

IEOR E4000: Production Management

IEOR E4004: Intro to OR: Deterministic Models

IEOR E4106: Intro to OR: Stochastic Models

All students must take at least 18 points of graduate work in the IEOR Department (denoted by courses with the IEOR designation) and at least 30 points of graduate studies at Columbia.



## 10. Master of Science in Operations Research

The Master of Science in Operations Research program (30 points) is designed to enable students to concentrate their studies in methodological areas such as mathematical programming, stochastic models, and simulation. The department offers a variety of domain specific courses in areas including logistics, supply chain management, revenue management, risk management, and financial engineering.

MSOR degree candidates are required to satisfy a **core program** of graduate courses:

SIEO W4150: Introduction to Probability and Statistics  
IEOR E4004: Intro to OR: Deterministic Models  
IEOR E4106: Intro to OR: Stochastic Models  
IEOR E4004: Simulation

All students must take at least 18 points of graduate work in the IEOR Department (denoted by courses with the IEOR designation) and at least 30 points of graduate studies at Columbia. In addition to courses within the engineering school, students can also take electives from various schools within the university, such as the Graduate School of Business, the School of International and Public Affairs, the Graduate School of Arts and Sciences, and the School of Law.

The Department suggests a number of **elective courses** depending on areas of interest. For students interested in the **area of Optimization**, the Department recommends taking at least three of the following elective courses:

IEOR E4000: Production and Operations Management  
IEOR E4210: Supply Chain Management  
IEOR E4405: Production Scheduling  
IEOR E4418: Logistics and Transportation Management  
IEOR E4600: Applied Integer Programming  
IEOR E4630: Asset Allocation

Students interested in the **area of Applied Probability** should consider taking at least three of the following elective courses:

IEOR E4000: Production and Operations Management  
IEOR E4210: Supply Chain Management  
IEOR E4220: Demand and Supply Analytics  
IEOR E4407: Game Theoretic Models of Operation  
IEOR E4601: Dynamic Pricing and Revenue Management  
IEOR E4602: Quantitative Risk Management  
IEOR E4700: Intro to Financial Engineering



Students interested in **financial and managerial applications of Operations Research** should consider taking:

Corporate Finance Courses	Derivatives Pricing Courses	Management Courses
IEOR E4403: Advanced Engineering & Corporate Economics	IEOR E4700: Intro to Financial Engineering	<i>At least one of:</i> IEOR E4510: Project Management
<i>And at least one of:</i> FINC B6302: Capital Markets & Investments FINC B8301: Advanced Corporate Finance ECIE W4280: Corporate Finance	<i>And at least one of:</i> IEOR E4602: Quantitative Risk Management IEOR E4630: Asset Allocation IEOR E4620: Pricing Models	IEOR E4550: Entrepreneurial Business Creation for Engineers IEOR E4998: Managing Technological Innovation IEOR E4505: O.R. in Public Policy IEOR E4705: Studies in O.R.



## 11. Joint Master of Science and Master of Business Administration

The joint M.S. and M.B.A. degrees program offered by the School of Engineering and Applied Sciences and the [Graduate School of Business](http://www0.gsb.columbia.edu) (www0.gsb.columbia.edu) train students interested in combining business and engineering careers. This option is available for students in the Financial Engineering, Industrial Engineering, and Operations Research programs.

A student will be expected to register full time for two terms in the School of Engineering and Applied Science and for three terms in the [Graduate School of Business](http://www0.gsb.columbia.edu).

MSIE/MBA and MSOR/MBA candidates are expected to complete a program of study that includes 24 points in SEAS (two semesters) and 45 points in the School of Business (three semesters). MSFE/MBA candidates must register for the first summer, fall, and spring terms in SEAS where they are expected to complete 30 points, then complete 45 points in the School of Business (three semesters).

Admission for the combined program requires filling out separate applications from both schools, meeting the requirements of both schools. Students in the program will have advisors assigned from both schools.



## 12. Professional Degree in Industrial Engineering

The professional degree of Industrial Engineering requires a minimum of 60 points (30 points beyond the M.S. degree in Industrial Engineering). The complete 60-point program includes (a) 30 points completed in 10 core courses, (b) a concentration of at least four courses, (c) other electives and (possibly) deficiencies.

A minimum of 12 courses, providing 36 points of credit, must be industrial engineering courses taken from departmental course offerings or at other institutions where advanced standing is given. A thesis is not required. A concentration consists of a minimum of four courses in one particular area. Some suggested areas of study are production management, regulated industries, industrial economics, business, statistics, and operations research. Other concentrations can be developed to suit special professional interests.



### 13. International Students

All international students must check-in with the International Students and Scholars Office. Their website is: [www.columbia.edu/cu/isso/isso.html](http://www.columbia.edu/cu/isso/isso.html). All immigration and status related questions must be directed to ISSO.

#### 13.1. Maintaining Lawful F-1 Status

It is very important to maintain your F-1 student status. As an F-1 student, you must adhere to the following guidelines (visit: [www.columbia.edu/cu/isso/visa/F-1/index.html](http://www.columbia.edu/cu/isso/visa/F-1/index.html) for more information):

1. Keep an unexpired passport valid for at least 6 months into the future.
2. Notify the ISSO of your address upon arrival and any time you change addresses.
3. Maintain full-time enrollment and normal, full-time progress toward your degree or certificate; this means 12 or more credits per semester in SEAS.
4. Obtain PRIOR authorization from the ISSO (if eligible) BEFORE dropping below a full course of study, withdrawing from classes, or taking a leave of absence.
5. If you leave the US without completing your program of study, complete your program early or change to another non-immigrant status, notify the ISSO so that your record in the DHS data base accurately reflects your current situation.
6. Do not accept any employment, either on- or off-campus, without written permission from the International Students and Scholars Office and, if necessary, authorization from the Department of Homeland Security (DHS).

Working without proper authorization is considered by the DHS as the most serious violation of its regulations. If you refer to your I-94 card, you will see the statement, "Warning: a nonimmigrant who accepts unauthorized employment is subject to deportation." It is most important, therefore, that you consult with the ISSO before you accept an offer of employment or begin to work. We will advise you whether it is possible for you to work and assist you with the appropriate procedures. It is illegal to begin to work while waiting for authorization; you must have the appropriate authorization first. Students in F-1 status are allowed to work on-campus for the University for a maximum of 20 hours per week during the academic year (unlimited during vacation periods) but MUST complete an I-9 form at the ISSO.

7. Make timely transfers of your F-1 supervision if you enroll at Columbia after attending another school in the United States.
8. Obtain extensions, as needed, of your permission to stay in the U.S. before your I-20 expires.
9. Once you have completed your studies and any practical training that is authorized, you must leave the U.S. or change to another immigration status within the appropriate time allowed.



10. Carry a copy of your passport and I-94 card with you at all times. When traveling outside the New York City area, you should bring the original I-94 card, I-20, and passport with you.
11. If applicable, comply with all [Special Registration Procedures for Certain Foreign Nationals](http://www.ice.gov/pi/specialregistration/index.htm) ([www.ice.gov/pi/specialregistration/index.htm](http://www.ice.gov/pi/specialregistration/index.htm)).

### 13.2. Work Eligibility for F-1 Students

For detail information, please visit: [www.columbia.edu/cu/isso/visa/F-1/index.html](http://www.columbia.edu/cu/isso/visa/F-1/index.html).

If you receive an offer from an employer, you must obtain the approval of the IEOR Department and ISSO prior to work.

**The following is a list of all opportunities to obtain authorization to work in the United States if you are in F-1 immigration status. Each category may allow for authorization under different circumstances and at different times during your stay in the U. S. For detailed information on a particular category, please click on the subject heading.**

**On-Campus Work** - Full-time students are allowed to work up to 20 hours per week during the academic year. On-campus employment means that you are paid by Columbia University or working at a University location with an employer that is providing services to students, such as the Bookstore. On-campus employment requires an I-9 Employment Verification Authorization form to be completed by you at the ISSO in advance of beginning to work.

**Practical Training** (with compensation) - This is defined as employment related to your field of study and is available during and after completion of your studies. The following is a list of the categories of practical training:

1. **Curricular** practical training (before completion of your studies) is defined as employment pursuant to a required or optional internship which is an integral part of the established curriculum of your school.
2. **Optional** practical training is defined as employment related to your field of study. It is authorized in variable increments, deducted from the maximum of one year of optional practical training per educational level, and is available in the following variations:
  1. optional practical training **after** completion of your studies.
  2. optional practical training **before** completion of your studies with three possible variations:
    - practical training during the annual vacation. The annual vacation must follow at least two consecutive terms of fulltime enrollment and is usually taken in the summer.



- practical training when school is in session, provided that employment does not exceed 20 hours per week
- practical training following completion of all course requirements for the degree except the thesis or equivalent

**Non-Compensated (Non-Paid) Training** - If an organization offers you non-paid employment, you may engage. However, employers may require you to earn academic credit. The IEOR Department will permit graduate students to earn academic credit towards their degree. Refer to Section 15.4 Internships for more information. Alternatively, if the employer permits, you may receive recognition (non-academic credit) on your transcript.

**Off-Campus Work Based on Financial Need** - Students who have been in F-1 status for one academic year and who are experiencing extreme financial difficulties due to unforeseen changes that severely affect their financial resources may apply for work permission. Authorization is given by the DHS with the recommendation of the International Students and Scholars Office (ISSO) or International Affairs Office (IAO).

**Internship with an International Organization** - Students in F-1 status are eligible to apply for permission to work for international organizations such as the World Bank, the International Monetary Fund, etc. Authorization is granted by the DHS with the recommendation of the ISSO or IAO.



## 14. Professional Development

The Department encourages all students to engage in professional development activities including professional etiquette workshops, interview workshops, taped mock interviews, resume workshops, employer presentations, industry speaker events, networking socials, recruiting events, etc. These initiatives are largely sponsored and offered by the IEOR Department and/or the Columbia University Center for Career Education ([www.cce.columbia.edu](http://www.cce.columbia.edu)).

### 14.1. Center for Career Education

The Center for Career Education (CCE) serves the students of a number of Columbia University schools, including the Fu Foundation School of Engineering and Applied Science. The IEOR Department partners with CCE to deliver meaningful career development programs and recruiting initiatives. All IEOR students should register with the CCE immediately upon arrival at: [www.cce.columbia.edu/seas/](http://www.cce.columbia.edu/seas/). Through the CCE website, you will gain access to various career related resources.

All IEOR students are expected to attend the CCE Overview Presentation offered during the start of the Summer and Fall terms. This presentation provides an overview of the various services and support at CCE, in addition to an introduction to the on/off-campus recruiting system.

### 14.2. IEOR Resume Portfolios

The IEOR Department compiles resume portfolios of each graduate program to distribute to over 450 registered employers. Many students have obtained full and part time employment through this initiative. In order to participate, a student must participate in the following three workshops:

1. Professional Etiquette Workshop
2. Interview Workshop
3. Resume Workshop

Students who have not successfully completed the three workshops above are not permitted to submit their resume to the IEOR Resume Portfolio. Workshops are offered during the beginning of the Summer, Fall and Spring terms.

### 14.3. Internships

Students in the IEOR Department have often been attracted to engaging in part time internship opportunities during the academic year (and full time opportunities during the summer).



Scheduling permitting, students may work maximum of 20 hours per week during an academic term.

#### 14.4. Internship for Academic Credit

IEOR graduate students may earn up to (3) three graded credits towards the M.S. degree through internship engagement. The student is responsible for the cost per credit, charged as regular tuition.

In order to commence, the student must adhere to the following guidelines:

1. Present an official written offer letter from the employer stating the terms of employment. This letter is submitted to Ms. Risa Cho or Ms. Jenny Mak for approval.
2. Employment may not exceed 20 hours per week during the academic year.
3. Adhere to the following schedule and deadlines:

Semester	Maximum Number of Credits	Minimum Hours of Work (Total)	Deadline to Apply
Fall	1.5	150	4 <sup>th</sup> week of classes
Spring	1.5	150	4 <sup>th</sup> week of classes
Summer	2	200	2 <sup>nd</sup> week of July
Summer (MSFE only)	1.5	120	1 <sup>st</sup> week of classes

This schedule also pertains to F-1 students requesting Practical Training during the academic terms. Please refer to Section 14.2 Work Eligibility for F-1 Students.

Alternatively, you may receive recognition (non-academic credit) on your transcript.

In order to earn a grade for the internship performed, the Department requires:

1. Signed letter from the employer, on official company letterhead, stating your responsibilities, performance, time frame, and number of hours worked. This letter should be addressed to:

IEOR Department, Columbia University  
 Attn: Ms. Risa Cho  
 500 West 120<sup>th</sup> Street, Room 313 Mudd  
 New York, NY 10027

The letter can also be faxed and emailed: (212) 854-8103; [info@ieor.columbia.edu](mailto:info@ieor.columbia.edu).

2. Written report by the student, at least 5 pages (double spaced, Times New Roman font, size 12, 1" margins) , elaborating on the experience, projects, and relevance to degree program. Samples of work/models/code are acceptable to supplement your report.



3. The letter and report must be received by the IEOR office by the following deadlines (failure to comply may result in incomplete or failure in the course.):

Semester	Maximum Number of Credits	Deadline to Submit Letter and Report
Fall	1.5	Last day of finals in December
Spring	1.5	Last day of finals in May
Summer	2	Third week of August
Summer (MSFE only)	1.5	Last week of classes in Summer Session I

#### 14.5. Research with Faculty

Besides industry work, the Department also urges graduate students to conduct research with faculty members. We recommend completing the core requirements first before engagement.

Conducting research with faculty members is a fruitful activity to gain experience and depth with the subject matter. Students may earn academic credits for meaningful and structured research. For more information, contact your faculty advisor for suggestions and dialogue around your research interests.

#### 14.6. Course Assistantships

The Department offers Course Assistantships to select graduate students. A Course Assistant (CA) is a student who has demonstrated exceptional academic promise in an area who can assist a faculty member in course administration. In order to be considered for the Course Assistantship, the Department requires that you be in good academic and conduct standing with the University. By applying for the position, you are indicating that you understand this. In addition, your submission provides consent to the Graduate Student Services or Office of Judicial Affairs to release information pertaining to your disciplinary/conduct history to the IEOR Department. Duties include: grading exams and homework assignments, classroom preparation and maintenance, course administration and liaison (i.e. emailing and addressing students, respond to course inquiries), and paperwork as necessary. Course Assistants do not instruct. Faculty will evaluate Course Assistants at the end of each term; future assignments are based on faculty evaluations and academic performance.

If you would like to apply for a Course Assistant position, please email [info@ieor.columbia.edu](mailto:info@ieor.columbia.edu). You will be notified if you are assigned to a course.

Course Assistants are compensated positions. Compensation is based on enrollment and amount of work assigned. If you are awarded a Course Assistantships, you must see Ms. Jaya Mohanty within the first two weeks of classes with necessary documents needed for payment.

Paperwork needed for completion is available on the Course Assistantship website:



[http://www.ieor.columbia.edu/misc-pages/course\\_assistantship.html](http://www.ieor.columbia.edu/misc-pages/course_assistantship.html)

Course Assistants will be paid on the following schedule:

Fall: 3<sup>rd</sup> week of October  
2<sup>nd</sup> week of December

Spring: 1<sup>st</sup> week of March  
1<sup>st</sup> week of May

Summer: End of Summer Session I  
End of Summer Session II

## 15. Location & Contact Information

### 15.1. Location

We are located in the Seeley W. Mudd Building, located on 500 West 120th Street, between Broadway and Amsterdam Avenue in New York City. We are on the 3rd floor.

Industrial Engineering and Operations Research Department  
The Fu Foundation School of Engineering and Applied Science, Columbia University  
Seeley W. Mudd Building, Room 313  
500 West 120th Street  
New York, NY 10027

Hours: 9:00AM – 5:00PM, Monday – Friday

### 15.2. Contact Information

The IEOR Department general information number is:

Phone: (212) 854-2942

Fax: (212) 854-8103

Web: [www.ieor.columbia.edu](http://www.ieor.columbia.edu)

If you have specific questions, please contact the appropriate areas below:

Curriculum and Degree Requirements

Phone: (212) 854-2942

Email: [info@ieor.columbia.edu](mailto:info@ieor.columbia.edu)



Professional Development

Email: [career@ieor.columbia.edu](mailto:career@ieor.columbia.edu)

Graduate Admissions

Phone: (212) 854-2941

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