The mission of the Institute for Data, Systems, and Society (IDSS) is to advance education and research in state-of-the-art, analytical methods in information and decision systems; statistics and data science; and the social sciences, and to apply these methods to address complex societal challenges in a diverse set of areas such as energy systems, finance, healthcare, social networks, and urban science. Its mission also includes the creation of an MIT-wide focal point for advancing research and educational programs related to statistics and data science.

Technology advances in areas such as smart sensors, big data, communications, computing, and social networking are rapidly scaling the size and complexity of interconnected systems and networks and, at the same time, are generating massive data that can lead to new insights and understanding. Research at IDSS will aim to understand and analyze data from across these systems, which present unique and substantial challenges due to scale, complexity, and the difficulties of extracting clear, actionable insights.

Our ability to understand data and develop models across complex, interconnected systems is at the core of our ability to uncover new insights and solutions.

Spanning all five schools at MIT, IDSS embraces the collision and synthesis of ideas and methods from analytical disciplines including statistics, data science, information theory and inference, systems and control theory, optimization, economics, human and social behavior, and network science. These disciplines are relevant both for understanding complex systems and for presenting design principles and architectures that allow for the systems’ quantification, management, and regulation. IDSS seeks to integrate these areas, fostering new collaborations, introducing new paradigms and abstractions, and utilizing the power of data to address societal challenges.

Undergraduate Study

Minor in Statistics and Data Science
The Minor in Statistics and Data Science (https://catalog.mit.edu/interdisciplinary/undergraduate-programs/minors/statistics-data-science) provides students with a working knowledge base in statistics, probability, and computation, along with an ability to perform data analysis. For a description of the minor, see Interdisciplinary Programs (https://catalog.mit.edu/interdisciplinary/undergraduate-programs).

Graduate Study

IDSS provides educational programs anchored in the following intellectual pillars: statistics, information and decision sciences, and human and institutional behavior.

IDSS’s academic programs embrace the collision and synthesis of ideas and methods from analytical disciplines, including statistics, stochastic modeling, information theory and inference, systems and control theory, optimization, economics, human and social behavior, and network science. Each of these fields in isolation is an insufficient basis for a deep understanding of complex interactions and systems. However, the intersections of these disciplines provide new tools and perspectives for understanding complex systems, addressing overarching challenges (including sustainability and systemic risk), and presenting design principles and architectures that enable those systems’ quantification, management, and regulation.

Inquiries about IDSS academic programs may be directed to the Academic Office (idss_academic_office@mit.edu).

Admission Requirements for Graduate Study
Application forms for all programs (http://web.mit.edu/admissions/graduate) are available online. Applicants whose first language is not English must offer evidence of written and oral proficiency in English by registering for the International English Language Testing System (IELTS) exam (http://www.ielts.org), academic format, and achieving a score of 7.5 or better. Information about the Graduate Record Examinations (GRE) (https://idss.mit.edu/academics) can be obtained through the IDSS website. Applicants should refer to the details of each program concerning specific requirements for admission.

Master of Science in Technology and Policy
The Technology and Policy Program (TPP) (http://tpp.mit.edu) educates students seeking leadership roles in the constructive development and use of technology—an area that is not well served by the traditional education of technical or social science specialists. TPP focuses on meeting the need for leaders who are engineers and scientists—people with not only strong technical foundations but also the skills and abilities to deal cogently and effectively with the economic, political, and administrative dimensions of the technological challenges of the 21st century.

The Master of Science in Technology and Policy is an engineering research degree with a focus on the increasingly central role of technology in the framing, formulation, and resolution of policy problems. Many students combine TPP’s curriculum with complementary subjects to obtain dual degrees in TPP and either a specialized branch of engineering or an applied social science, such as political science or urban studies and planning.
TPP's coursework provides a solid grounding in technology and policy by combining advanced subjects in the student's chosen technical field with courses in economics, politics, modern quantitative methods, and social science. All students must complete a satisfactory research thesis that has a substantial technology and policy component. In order to prepare students for effective professional practice, TPP stresses leadership and communication. It also encourages students to participate in TPP's summer internship program, which places students in government and industry in the US and around the world.

The TPP curriculum consists of three blocks of subjects and a research thesis. The first block is a required integrative subject in technology and policy and a subject in applied quantitative methods. The second block focuses on training in formal frameworks for policy development and consists of subjects in microeconomics, political economy, and one core restricted elective that treats problems of technology and policy from a domain that is outside that of the students' area of research concentration and deepens the students' understanding of framings and rationales for governance in this area. The third block comprises a minimum of three coherent electives that fulfill professional and research objectives. The research thesis is the culmination of scholarship integrating technology and policy.

Completion of the academic and research requirements of the TPP SM typically takes four terms.

The TPP curriculum normally begins in September; applications are due by December 15. TPP seeks applicants with relevant work or research experience as well as the ability to demonstrate evidence of leadership and initiative in their professional or other activities. All applicants should have a strong basis in engineering or science. For the 2025 admissions cycle, the GRE General Test will be optional.

Contact the TPP program office (tpp@mit.edu), Room E17-373, 617-258-7295, for additional information.

Doctor of Philosophy in Social and Engineering Systems

The Doctor of Philosophy in Social and Engineering Systems (SES) (http://idss.mit.edu/academics/SES_doc) is focused on addressing concrete and societally significant problems by combining methods from engineering and the social sciences. A student's doctoral program includes coursework that prepares them for advanced, rigorous, and original research leading to a doctoral thesis. Both coursework and research must include breadth and depth in engineering and quantitative methods, as well as in the social sciences, and in a particular application domain.

Student research in SES is characterized by the following traits:

- It is driven by problems of societal interest, in areas such as energy, finance, health care, social networks, urban science, as well as in policy-related topics.
- It is application domain driven.

- It involves quantitative methods. The program is focused on problems that can be addressed through mathematical modeling and data analysis.
- It relies on real-world data. Research is expected to analyze data from the application domain of interest, and draw upon the training provided in statistics, etc., through the program's coursework.
- It engages societal aspects of the problem. The research incorporates theories and tools from the social sciences.

The program’s subject requirements follow. Waivers for some of the requirements are possible in special circumstances.

<table>
<thead>
<tr>
<th>Core</th>
<th>Select 12 units from each of three areas below:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Probability</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Statistics</strong></td>
<td></td>
</tr>
<tr>
<td>18.6501</td>
<td>Fundamentals of Statistics</td>
</tr>
<tr>
<td>18.655</td>
<td>Mathematical Statistics</td>
</tr>
<tr>
<td>IDS.131[J]</td>
<td>Statistics, Computation and Applications</td>
</tr>
<tr>
<td><strong>Social Science</strong></td>
<td></td>
</tr>
<tr>
<td>17.850</td>
<td>Political Science Scope and Methods</td>
</tr>
<tr>
<td>21A.809</td>
<td>Designing Empirical Research in the Social Sciences</td>
</tr>
<tr>
<td>21A.819</td>
<td>Ethnographic Research Methods</td>
</tr>
<tr>
<td><strong>Microeconomics / Causal Inference</strong></td>
<td></td>
</tr>
<tr>
<td>14.121 &amp; 14.122</td>
<td>Microeconomic Theory I and Microeconomic Theory II</td>
</tr>
<tr>
<td>14.320</td>
<td>Econometric Data Science</td>
</tr>
<tr>
<td>14.386</td>
<td>New Econometric Methods</td>
</tr>
<tr>
<td>14.388</td>
<td>Inference on Causal and Structural Parameters Using ML and AI</td>
</tr>
<tr>
<td>17.802</td>
<td>Quantitative Research Methods II: Causal Inference</td>
</tr>
<tr>
<td><strong>Information Systems and Decision Science</strong></td>
<td></td>
</tr>
<tr>
<td>One subject from the list of Statistical Processing of Data Subjects below</td>
<td></td>
</tr>
<tr>
<td>One subject of substantial mathematical content ¹</td>
<td></td>
</tr>
<tr>
<td>Two subjects belonging to a sequence that provides increasing depth on a particular topic ²</td>
<td></td>
</tr>
</tbody>
</table>

| **Social Science** |  |

1. A subject must be at the graduate level. ². A sequence is a series of two or more subjects chosen in a coherent manner.
Four subjects that create a coherent and rigorous program of study in the social sciences, providing necessary background for research, including:

Three subjects comprising a coherent collection that builds depth in a particular social science focus area.

Criteria defined by the graduate program committee.

Subjects used to satisfy the core can be counted toward this requirement. However, the remaining subjects should be at a more-advanced level.

One subject may be satisfied by an internship or independent study in which the student is evaluated on their performance of hands-on work in a particular domain.

Subjects used to satisfy the core and applied requirements.

Statistical Processing of Data Subjects

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.7810</td>
<td>Algorithms for Inference</td>
<td>12</td>
</tr>
<tr>
<td>6.7900</td>
<td>Machine Learning</td>
<td>12</td>
</tr>
<tr>
<td>14.382</td>
<td>Econometrics</td>
<td>12</td>
</tr>
<tr>
<td>15.077[J]</td>
<td>Statistical Machine Learning and Data Science</td>
<td>12</td>
</tr>
<tr>
<td>16.391</td>
<td>Statistics for Engineers and Scientists</td>
<td>12</td>
</tr>
<tr>
<td>17.802</td>
<td>Quantitative Research Methods II: Causal Inference</td>
<td>12</td>
</tr>
<tr>
<td>17.804</td>
<td>Quantitative Research Methods III: Generalized Linear Models and Extensions</td>
<td>12</td>
</tr>
<tr>
<td>17.806</td>
<td>Quantitative Research Methods IV: Advanced Topics</td>
<td>12</td>
</tr>
</tbody>
</table>

The program begins in September and applications are due by December 15 of the preceding year.

Further information about SES is available on the program website (http://idss.mit.edu/academics/SES_doc) or by contacting the IDSS Academic Office (idss_academic_office@mit.edu), Room E17-375, or 617-253-1182.

Research Centers

Research in IDSS addresses overarching challenges, including the modeling and prediction of system behavior and performance; systems design and architecture; and issues including social welfare, monetization, and regulation, as well as sustainability and resilience, cascades and contagion phenomena, and systemic risk.

IDSS will sustain this research agenda by fostering and prioritizing several types of strong connections, including:

- A community of experts, at MIT and elsewhere, with demonstrated success performing impactful, multidisciplinary research in these domains.
- A close connection between research and domain expertise, to enable a contextually-informed understanding of the challenges and opportunities in complex systems.
- Educational and research methodologies, not considered in isolation, but instead anchored in one or several of the cross-disciplinary fields of statistics, information and decision sciences, the science of interconnections, as well as the study of social and institutional behavior.

Sociotechnical Systems Research Center

The Sociotechnical Systems Research Center (SSRC) (http://ssrc.mit.edu) is an interdisciplinary research center that focuses on the study of high-impact, complex, sociotechnical systems that shape our world.

SSRC brings together faculty, researchers, students, and staff from across MIT to study and seek solutions to complex societal challenges that span healthcare, energy, infrastructure networks, the environment, and international development.

For further information on SSRC and its programs (https://catalog.mit.edu/mit/research/sociotechnical-systems-research-center), see the Research and Study (https://catalog.mit.edu/mit/research) section.

Faculty and Teaching Staff

Fotini Christia, PhD
Ford International Professor in the Social Sciences
Professor of Political Science
Director, Institute for Data, Systems, and Society

Dean Eckles, PhD
William F. Pounds Professor of Management
Associate Professor of Marketing
Associate Director, Institute for Data, Systems, and Society

Frank R. Field III, PhD
Senior Research Engineer
Lecturer of Data, Systems, and Society
Graduate Officer, Institute for Data, Systems, and Society

Ankur Moitra, PhD
Norbert Wiener Professor of Mathematics
Associate Director, Institute for Data, Systems, and Society (On leave)
Professors
Alberto Abadie, PhD
Professor of Economics
Member, Institute for Data, Systems, and Society
Daron Acemoglu, PhD
Institute Professor
Professor of Economics
Member, Institute for Data, Systems, and Society
Saurabh Amin, PhD
Professor of Civil and Environmental Engineering
Member, Institute for Data, Systems, and Society
Sinan Aral, PhD
David Austin Professor in Management
Professor of Information Technology and Marketing
Member, Institute for Data, Systems, and Society
Nicholas A. Ashford, JD, PhD
Professor of Technology and Policy
Member, Institute for Data, Systems, and Society
Hamsa Balakrishnan, PhD
William E. Leonhard (1940) Professor
Professor of Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society
Adam Berinsky, PhD
Mitsui Professor of Political Science
Professor of Political Science
Member, Institute for Data, Systems, and Society
Dimitri P. Bertsekas, PhD
Jerry McAfee (1940) Professor Post-Tenure in Engineering
Professor Post-Tenure of Electrical Engineering
Member, Institute for Data, Systems, and Society
Robert C. Berwick, PhD
Professor Post-Tenure of Computer Science and Engineering and Computational Linguistics
Member, Institute for Data, Systems, and Society
Alessandro Bonatti, PhD
John Norris Maguire (1960) Professor
Professor of Applied Economics
Member, Institute for Data, Systems, and Society
Emery N. Brown, MD, PhD
Edward Hood Taplin Professor of Medical Engineering
Warren M. Zapol Professor of Anaesthesia, HMS
Professor of Computational Neuroscience
Member, Institute for Data, Systems, and Society
Core Faculty, Institute for Medical Engineering and Science
Victor V. Chernozhukov, PhD
Ford International Professor
Professor of Economics
Member, Institute for Data, Systems, and Society
Nazli Choucri, PhD
Professor of Political Science
Member, Institute for Data, Systems, and Society
Munther A. Dahleh, PhD
William A. Coolidge Professor
Professor of Electrical Engineering and Computer Science
Member, Institute for Data, Systems, and Society
Richard de Neufville, PhD
Professor of Data, Systems, and Society
Esther Duflo, PhD
Abdul Latif Jameel Professor of Poverty Alleviation and Development Economics
Member, Institute for Data, Systems, and Society
Robert Michael Freund, PhD
Theresa Seley Professor in Management Sciences
Professor of Operations Research
Member, Institute for Data, Systems, and Society
David Gamarnik, PhD
Nanyang Technological University Professor
Professor of Operations Research
Member, Institute for Data, Systems, and Society
Polina Golland, PhD
Sunlin (1966) and Priscilla Chou Professor
Professor of Computer Science and Engineering
Member, Institute for Data, Systems, and Society
Stephen C. Graves, PhD
Abraham J. Siegel Professor Post-Tenure of Management
Professor Post-Tenure of Operations Management and Leaders for Global Operations
Professor Post-Tenure of Mechanical Engineering
Member, Institute for Data, Systems, and Society
D. Fox Harrell Jr, PhD
Professor of Digital Media
Member, Institute for Data, Systems, and Society
Daniel E. Hastings, PhD
Cecil and Ida Green Professor in Education
Professor of Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society
Anette E. Hosoi, PhD
Neil and Jane Pappalardo Professor
Professor of Mechanical Engineering
Professor of Mathematics
Member, Institute for Data, Systems, and Society

Tommi S. Jaakkola, PhD
Thomas M. Siebel Distinguished Professor
Professor of Electrical Engineering and Computer Science
Member, Institute for Data, Systems, and Society
(On leave, spring)

Ali Jadbabaie, PhD
JR East Professor of Engineering
Professor of Civil and Environmental Engineering
Head, Department of Civil and Environmental Engineering
Member, Institute for Data, Systems, and Society

Patrick Jaillet, PhD
Dugald C. Jackson Professor in Electrical Engineering
Professor of Electrical Engineering and Computer Science
Professor of Civil and Environmental Engineering
Member, Institute for Data, Systems, and Society

Sertac Karaman, PhD
Professor of Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society

Christopher Roland Knittel, PhD
George P. Shultz Professor
Professor of Applied Economics
Member, Institute for Data, Systems, and Society
Associate Dean for Climate and Sustainability, MIT Sloan School of Management

Andrew W. Lo, PhD
Charles E. and Susan T. Harris Professor
Professor of Finance
Member, Institute for Data, Systems, and Society

Youssef M. Marzouk, PhD
Breene M. Kerr (1951) Professor
Professor of Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society
(On leave)

Alexandre Megretski, PhD
Professor of Electrical Engineering
Member, Institute for Data, Systems, and Society

Eytan H. Modiano, PhD
Richard Cockburn Maclaurin Professor in Aeronautics and Astronautics
Professor of Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society

Whitney K. Newey, PhD
Ford Professor
Professor of Economics
Member, Institute for Data, Systems, and Society

Dava Newman, PhD
Apollo Program Professor of Astronautics and Engineering Systems
Member, Institute for Data, Systems, and Society
Affiliate Faculty, Institute for Medical Engineering and Science
Member, Health Sciences and Technology Faculty

Kenneth A. Oye, PhD
Professor Post-Tenure of Political Science
Member, Institute for Data, Systems, and Society

Asuman E. Ozdaglar, PhD
MathWorks Professor of Electrical Engineering and Computer Science
Head, Department of Electrical Engineering and Computer Science
Professor of Electrical Engineering
Deputy Dean of Academics, MIT Schwarzman College of Computing
Member, Institute for Data, Systems, and Society

Pablo A. Parrilo, PhD
Joseph F. and Nancy P. Keithley Professor in Electrical Engineering
Professor of Electrical Engineering and Computer Science
Professor of Mathematics
Member, Institute for Data, Systems, and Society
(On leave)

Alex Pentland, PhD
Professor Post-Tenure of Media Arts and Sciences
Member, Institute for Data, Systems, and Society

Jaime Peraire, PhD
H. N. Slater Professor in Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society

Yury Polyanskiy, PhD
Professor of Electrical Engineering and Computer Science
Member, Institute for Data, Systems, and Society

Hazhir Rahmandad, PhD
Schussel Family Professor of Management Science
Professor of System Dynamics
Member, Institute for Data, Systems, and Society

Alexander Rakhlin, PhD
Professor of Brain and Cognitive Sciences
Member, Institute for Data, Systems, and Society
(On sabbatical)
David Rand, PhD
Erwin H. Schell Professor
Professor of Marketing
Professor of Brain and Cognitive Sciences
Member, Institute for Data, Systems, and Society
(On leave)

Roberto Rigobon, PhD
Society of Sloan Fellows Professor
Professor of Applied Economics
Member, Institute for Data, Systems, and Society

Philippe Rigollet, PhD
Professor of Mathematics
Member, Institute for Data, Systems, and Society

Deb K. Roy, PhD
Professor of Media Arts and Sciences
Member, Institute for Data, Systems, and Society

Themistoklis Sapsis, PhD
William I. Koch Professor
Professor of Mechanical and Ocean Engineering
Member, Institute for Data, Systems, and Society

Lawrence Sass, PhD
Professor of Computation and Design
Member, Institute for Data, Systems, and Society

Noelle Eckley Selin, PhD
Professor of Data, Systems, and Society
Professor of Earth, Atmospheric and Planetary Sciences

Devavrat Shah, PhD
Andrew (1956) and Erna Viterbi Professor
Professor of Electrical Engineering and Computer Science
Member, Institute for Data, Systems, and Society

Yossi Sheffi, PhD
Elisha Gray II Professor
Professor of Civil and Environmental Engineering
Member, Institute for Data, Systems, and Society

Susan S. Silbey, PhD
Leon and Anne Goldberg Professor of Humanities
Professor of Sociology and Anthropology
Professor of Behavioral and Policy Studies
Member, Institute for Data, Systems, and Society

David Simchi-Levi, PhD
Professor of Civil and Environmental Engineering
Member, Institute for Data, Systems, and Society

Jean-Jacques E. Slotine, PhD
Professor of Mechanical Engineering
Professor of Information Sciences
Member, Institute for Data, Systems, and Society

John Sterman, PhD
Jay W. Forrester Professor of Management
Professor of System Dynamics
Member, Institute for Data, Systems, and Society

Charles H. Stewart III, PhD
Kenan Sahin (1963) Distinguished Professor
Professor of Political Science
Member, Institute for Data, Systems, and Society
(On leave, spring)

Tavneet Suri, PhD
Louis E. Seley Professor in Applied Economics
Professor of Applied Economics
Member, Institute for Data, Systems, and Society

Jesse Thaler, PhD
Professor of Physics
Member, Institute for Data, Systems, and Society

Jessika Trancik, PhD
Professor of Data, Systems, and Society

John N. Tsitsiklis, PhD
Clarence J. LeBel Professor in Electrical Engineering and Computer Science
Professor Post-Tenure of Electrical Engineering
Member, Institute for Data, Systems, and Society

Caroline Uhler, PhD
Professor of Electrical Engineering and Computer Science
Member, Institute for Data, Systems, and Society

Martin J. Wainwright, PhD
Cecil H. Green Professor in Electrical Engineering
Professor of Electrical Engineering and Computer Science
Professor of Mathematics
Member, Institute for Data, Systems, and Society

Roy E. Welsch, PhD
Eastman Kodak Leaders for Global Operations Professor of Management
Professor of Statistics
Member, Institute for Data, Systems, and Society

Moe Z. Win, PhD
Robert R. Taylor Professor
Professor of Aeronautics and Astronautics
Member, Institute for Data, Systems, and Society
Gregory W. Wornell, PhD  
Sumitomo Electric Industries Professor in Engineering  
Professor of Electrical Engineering  
Member, Institute for Data, Systems, and Society

Jinhua Zhao, PhD  
Professor of Urban Planning and Transportation  
Professor of Civil and Environmental Engineering  
Member, Institute for Data, Systems, and Society

Associate Professors  
Guy Bresler, PhD  
Associate Professor of Electrical Engineering and Computer Science  
Member, Institute for Data, Systems, and Society  
(On leave)

Tamara A. Broderick, PhD  
Associate Professor of Electrical Engineering and Computer Science  
Member, Institute for Data, Systems, and Society

Luca Carlone, PhD  
Boeing Career Development Professor in Aeronautics and Astronautics  
Associate Professor of Aeronautics and Astronautics  
Member, Institute for Data, Systems, and Society

Stefanie Sabrina Jegelka, ScD  
Associate Professor of Electrical Engineering and Computer Science  
Member, Institute for Data, Systems, and Society  
(On leave)

In Song Kim, PhD  
Associate Professor of Political Science  
Member, Institute for Data, Systems, and Society

Rahul Mazumder, PhD  
Nanyang Technological University Professor  
Associate Professor of Operations Research  
Member, Institute for Data, Systems, and Society

Richard Nielsen, PhD  
Associate Professor of Political Science  
Member, Institute for Data, Systems, and Society

Ramesh Raskar, PhD  
Associate Professor of Media Arts and Sciences  
Member, Institute for Data, Systems, and Society

Suvrit Sra, PhD  
Associate Professor of Electrical Engineering and Computer Science  
Member, Institute for Data, Systems, and Society  
(On leave)

Sarah E. Williams, MCP  
Norman B. and Muriel Leventhal Professor  
Associate Professor of Information Technologies and Urban Planning  
Member, Institute for Data, Systems, and Society

Assistant Professors  
Navid Azizan, PhD  
Edgerton Career Development Professor  
Assistant Professor of Mechanical Engineering  
Member, Institute for Data, Systems, and Society

Rahul Bhui, PhD  
Class of 1958 Career Development Professor  
Assistant Professor of Marketing  
Member, Institute for Data, Systems, and Society

Crystal Lee, PhD  
Assistant Professor of Comparative Media Studies  
Member, Institute for Data, Systems, and Society

Sherrie Wang, PhD  
Brit (1965) and Alex (1949) d'Arbeloff Career Development Professor  
Assistant Professor of Mechanical Engineering  
Member, Institute for Data, Systems, and Society

Cathy Wu, PhD  
Assistant Professor of Civil and Environmental Engineering  
Member, Institute for Data, Systems, and Society

Research Staff  
Senior Research Scientists  
Stan N. Finkelstein, MD  
Senior Research Scientist of Data, Systems, and Society

Principal Research Scientists  
Audun Botterud, PhD  
Principal Research Scientist of Data, Systems, and Society

Mardavij Rozbehani, PhD  
Principal Research Scientist of Data, Systems, and Society

Kalyan Veeramachaneni, PhD  
Principal Research Scientist of Data, Systems, and Society

Professors Emeriti  
Richard Charles Larson, PhD  
Mitsui Professor Emeritus  
Professor Emeritus of Data, Systems, and Society

Daniel Roos, PhD  
Professor Emeritus of Data, Systems, and Society  
Professor Emeritus of Civil and Environmental Engineering
IDS.012[J] Statistics, Computation and Applications
Same subject as 6.370[J]
Subject meets with 6.3732[J], IDS.131[J]
Prereq: (6.100B, (18.03, 18.06, or 18.C06[J]), and (6.3700, 6.3800, 14.30, 16.09, or 18.05)) or permission of instructor
U (Spring)
3-1-8 units

Hands-on analysis of data demonstrates the interplay between statistics and computation. Includes four modules, each centered on a specific data set, and introduced by a domain expert. Provides instruction in specific, relevant analysis methods and corresponding algorithmic aspects. Potential modules may include medical data, gene regulation, social networks, finance data (time series), traffic, transportation, weather forecasting, policy, or industrial web applications. Projects address a large-scale data analysis question. Students taking graduate version complete additional assignments. Enrollment limited; priority to Statistics and Data Science minors, and to juniors and seniors.
C. Uhler, N. Azizan

IDS.013[J] Statistical Thinking and Data Analysis
Same subject as 15.075[J]
Prereq: 6.3700 or 15.069
U (Spring)
3-1-8 units. Institute LAB

See description under subject 15.075[J].
M. Fazel Zarandi

IDS.014[J] Fundamentals of Statistics
Same subject as 18.650[J]
Subject meets with 18.6501
Prereq: 6.3700 or 18.600
U (Fall, Spring)
4-0-8 units

See description under subject 18.650[J].
Fall: P. Rigollet. Spring: A. Katsevich

IDS.045[J] System Safety
Same subject as 16.63[J]
Prereq: None
U (Fall)
3-0-9 units. REST

See description under subject 16.63[J].
N. Leveson

IDS.050[J] Cybersecurity
Same subject as 17.447[J], MAS.460[J]
Subject meets with 17.448[J], IDS.350[J], MAS.660[J]
Prereq: None
U (Spring)
3-0-9 units. HASS-S

See description under subject 17.447[J].
N. Choucri, S. Pentland

IDS.055[J] Science, Technology, and Public Policy
Same subject as 17.309[J], STS.082[J]
Prereq: None
Acad Year 2024-2025: Not offered
Acad Year 2025-2026: U (Fall)
4-0-8 units. HASS-S; CI-H
Credit cannot also be received for 17.310[J], IDS.412[J], STS.482[J]

See description under subject 17.309[J].
N. Selin

IDS.057[J] Data and Society
Same subject as 11.155[J], STS.005[J]
Prereq: None
Acad Year 2024-2025: Not offered
Acad Year 2025-2026: U (Spring)
3-0-9 units. HASS-H

See description under subject STS.005[J].
E. Medina, S. Williams
IDS.060[J] Environmental Law, Policy, and Economics: Pollution Prevention and Control
Same subject as 1.801[J], 11.021[J], 17.393[J]
Subject meets with 1.811[J], 11.630[J], 15.663[J], IDS.540[J]
Prereq: None
U (Spring)
3-0-9 units. HASS-S

Analyzes federal and state regulation of air and water pollution, hazardous waste, greenhouse gas emissions, and production/use of toxic chemicals. Analyzes pollution/climate change as economic problems and failure of markets. Explores the role of science and economics in legal decisions. Emphasizes use of legal mechanisms and alternative approaches (i.e., economic incentives, voluntary approaches) to control pollution and encourage chemical accident and pollution prevention. Focuses on major federal legislation, underlying administrative system, and common law in analyzing environmental policy, economic consequences, and role of the courts. Discusses classical pollutants and toxic industrial chemicals, greenhouse gas emissions, community right-to-know, and environmental justice. Develops basic legal skills: how to read/understand cases, regulations, and statutes. Students taking graduate version explore the subject in greater depth.

N. Ashford, C. Caldart

IDS.061[J] Regulation of Chemicals, Radiation, and Biotechnology
Same subject as 1.802[J], 11.022[J]
Subject meets with 1.812[J], 10.805[J], 11.631[J], IDS.436[J], IDS.541[J]
Prereq: IDS.060[J] or permission of instructor
U (Spring)
Not offered regularly; consult department
3-0-9 units

Focuses on policy design and evaluation in the regulation of hazardous substances and processes. Includes risk assessment, industrial chemicals, pesticides, food contaminants, pharmaceuticals, radiation and radioactive wastes, product safety, workplace hazards, indoor air pollution, biotechnology, victims' compensation, and administrative law. Health and economic consequences of regulation, as well as its potential to spur technological change, are discussed for each regulatory regime. Students taking the graduate version are expected to explore the subject in greater depth.

N. Ashford, C. Caldart

IDS.062[J] Global Environmental Negotiations
Same subject as 12.346[J]
Prereq: Permission of instructor
U (Fall)
Not offered regularly; consult department
2-0-4 units

Practical introduction to global environmental negotiations designed for science and engineering students. Covers basic issues in international negotiations, such as North-South conflict, implementation and compliance, trade, and historical perspective on global environmental treaties. Offers hands-on practice in developing and interpreting international agreements through role-play simulations and observation of ongoing climate change negotiating processes. Students taking graduate version complete additional assignments.

N. E. Selin

IDS.063[J] People and the Planet: Environmental Governance and Science
Same subject as 12.387[J], 15.874[J]
Prereq: None
U (Fall)
3-0-6 units

See description under subject 12.387[J].

N. Selin, S. Solomon, J. Sterman

IDS.065[J] Energy Systems for Climate Change Mitigation
Same subject as 1.067[J], 10.421[J]
Subject meets with 1.670[J], 10.621[J], IDS.521[J]
Prereq: (Calculus I (GIR), Chemistry (GIR), and Physics I (GIR)) or permission of instructor
U (Fall)
3-0-9 units

Reviews the contributions of energy systems to global greenhouse gas emissions, and the levers for reducing those emissions. Lectures and projects focus on evaluating energy systems against climate policy goals, using performance metrics such as cost, carbon intensity, and others. Student projects explore pathways for realizing emissions reduction scenarios. Projects address the climate change mitigation potential of energy technologies (hardware and software), technological and behavioral change trajectories, and technology and policy portfolios. Background in energy systems strongly recommended. Students taking the graduate version complete additional assignments and explore the subject in greater depth. Preference to students in the Energy Studies or Environment and Sustainability minors.

J. Trancik
IDS.066[J] Law, Technology, and Public Policy
Same subject as 11.122[J]
Subject meets with 11.422[J], 15.655[J], IDS.435[J]
Prereq: None
U (Fall)
3-0-9 units. HASS-S
Examines how law, economics, and technological change shape public policy, and how law can sway technological change; how the legal system responds to environmental, safety, energy, social, and ethical problems; how law and markets interact to influence technological development; and how law can affect wealth distribution, employment, and social justice. Covers energy/climate change; genetic engineering; telecommunications and role of misinformation; industrial automation; effect of regulation on technological innovation; impacts of antitrust law on innovation and equity; pharmaceuticals; nanotechnology; cost/benefit analysis as a decision tool; public participation in governmental decisions affecting science and technology; corporate influence on technology and welfare; and law and economics as competing paradigms to encourage sustainability. Students taking graduate version explore subject in greater depth.
N. Ashford, C. Caldart

IDS.075[J] Transportation: Foundations and Methods
Same subject as 1.041[J]
Subject meets with 1.200[J], 11.544[J], IDS.675[J]
Prereq: (1.010 and (1.00 or 1.000)) or permission of instructor
U (Spring)
3-1-8 units
See description under subject 1.041[J].
C. Wu

IDS.131[J] Statistics, Computation and Applications
Same subject as 6.3732[J]
Subject meets with 6.3730[J], IDS.012[J]
Prereq: (6.100B, (18.03, 18.06, or 18.060[J]), and (6.3700, 6.3800, 14.30, 16.09, or 18.05)) or permission of instructor
G (Spring)
3-1-8 units
Hands-on analysis of data demonstrates the interplay between statistics and computation. Includes four modules, each centered on a specific data set, and introduced by a domain expert. Provides instruction in specific, relevant analysis methods and corresponding algorithmic aspects. Potential modules may include medical data, gene regulation, social networks, finance data (time series), traffic, transportation, weather forecasting, policy, or industrial web applications. Projects address a large-scale data analysis question. Students taking graduate version complete additional assignments. Limited enrollment; priority to Statistics and Data Science minors and to juniors and seniors.
C. Uhler, N. Azizan

Same subject as 6.7820[J]
Prereq: 6.3702 and 18.06
G (Fall)
Not offered regularly; consult department
3-0-9 units
Provides instruction in the geometric, algebraic and combinatorial perspective on graphical models. Presents methods for learning the underlying graph and inferring its parameters. Topics include exponential families, duality theory, conic duality, polyhedral geometry, undirected graphical models, Bayesian networks, Markov properties, total positivity of distributions, hidden variables, and tensor decompositions.
C. Uhler

IDS.140[J] Reinforcement Learning: Foundations and Methods
Same subject as 1.127[J], 6.7920[J]
Prereq: 6.3700 or permission of instructor
G (Fall)
4-0-8 units
See description under subject 6.7920[J].
C. Wu, M. Dahleh
IDS.145[J] Data Mining: Finding the Models and Predictions that Create Value
Same subject as 15.062[J]
Subject meets with 15.0621
Prereq: 15.060, 15.075[J], or permission of instructor
G (Spring; second half of term)
2-0-4 units
See description under subject 15.062[J].
R. E. Welsch

IDS.147[J] Statistical Machine Learning and Data Science
Same subject as 15.077[J]
Prereq: Permission of instructor
G (Spring)
4-0-8 units
See description under subject 15.077[J].
R. E. Welsch

Same subject as 9.521[J], 18.656[J]
Prereq: (6.7700[J], 18.06, and 18.6501) or permission of instructor
G (Spring)
3-0-9 units
See description under subject 9.521[J].
S. Rakhlin, P. Rigollet

IDS.190 Doctoral Seminar in Statistics and Data Science
Prereq: None
G (Fall)
1-0-2 units
Interdisciplinary seminar explores diverse topics in statistics and data science. Restricted to students in the Interdisciplinary Doctoral Program in Statistics.
Consult D. Shah

Same subject as 1.271[J], 15.764[J]
Prereq: (6.7210[J] and 6.7700[J]) or permission of instructor
G (Spring)
3-0-9 units
Can be repeated for credit.
See description under subject 15.764[J].
Staff

IDS.305[J] Business and Operations Analytics
Same subject as 1.275[J]
Prereq: Permission of instructor
G (Spring; first half of term)
2-0-4 units
Provides instruction on identifying, evaluating, and capturing business analytics opportunities that create value. Also provides basic instruction in analytics methods and case study analysis of organizations that successfully deployed these techniques.
D. Simchi-Levi

IDS.332 System Design and Management for a Changing World: Combined
Engineering School-Wide Elective Subject.
Offered under: 1.146, 16.861, EM.422, IDS.332
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Credit cannot also be received for EM.423[J], IDS.333[J]
Practical-oriented subject that builds upon theory and methods and culminates in extended application. Covers methods to identify, value, and implement flexibility in design (real options). Topics include definition of uncertainties, simulation of performance for scenarios, screening models to identify desirable flexibility, decision analysis, and multidimensional economic evaluation. Students demonstrate proficiency through an extended application to a system design of their choice. Complements research or thesis projects. Class is “flipped” to maximize student engagement and learning. Meets with IDS.333[J] in the first half of term. Enrollment limited.
R. de Neufville

Same subject as EM.423[J]
Prereq: None
G (Fall; first half of term)
3-0-3 units
Credit cannot also be received for 1.146, 16.861, EM.422, IDS.332
Focuses on design choices and decisions under uncertainty. Topics include identification and description of uncertainties using probability distributions; the calculation of commensurate measures of value, such as expected net present values; Monte Carlo simulation and risk analysis; and the use of decision analysis to explore alternative strategies and identify optimal initial choices. Presents applied analysis of practical examples from a variety of engineering systems using spreadsheet and decision analysis software. Class is “flipped” to maximize student engagement and learning. Meets with IDS.332 first half of term.
R. de Neufville
Same subject as EM.424[J]
Prereq: IDS.333[J] or permission of instructor
G (Fall, Spring)
3·0·3 units
Focuses on implementation of flexibility (real options) in the design of products, start-ups, ongoing management of operations, or policy plans. Applies the methods presented in IDS.333[J]: recognition of uncertainty, identification of best opportunities for flexibility, and valuation of these options and their effective implementation. Students work on their own project concept, for which they develop a dynamic business plan for design, deployment, and most beneficial implementation of their system over time. Useful complement to thesis or research projects. Class is “flipped” to maximize student engagement and learning. Subject meets in second half of term in the fall and first half of term in the spring.
R. de Neufville

IDS.336[J] Systems Architecting Applied to Enterprises
Same subject as 16.855[J], EM.429[J]
Prereq: Permission of instructor
G (Spring)
3·0·9 units
Focuses on understanding, designing and transforming sociotechnical enterprises using systems principles and practices. Includes discussions and reading on enterprise theory, systems architecting, transformation challenges and case studies of evolving enterprises. Covers frameworks and methods for ecosystem analysis, stakeholder analysis, design thinking, systems architecture and evaluation, and human-centered enterprise design strategies. Students engage in interactive breakout sessions during class and participate in a selected small team project to design a future architecture for a real-world enterprise. Selected projects are based on student interests in enterprises such as small, medium, or large companies, government agencies, academic units, start-ups, and nonprofit organizations.
D. Rhodes

IDS.337[J] Aerospace Biomedical and Life Support Engineering
Same subject as 16.423[J], HST.515[J]
Prereq: 16.06, 16.400, or permission of instructor
Acad Year 2024-2025: Not offered
Acad Year 2025-2026: G (Spring)
3·0·9 units
See description under subject 16.423[J].
D. J. Newman

IDS.338[J] Multidisciplinary Design Optimization
Same subject as 16.888[J], EM.428[J]
Prereq: 18.085 or permission of instructor
Acad Year 2024-2025: Not offered
Acad Year 2025-2026: G (Fall)
3·1·8 units
See description under subject 16.888[J].
O. de Weck

IDS.339[J] Space Systems Engineering
Same subject as 16.89[J]
Prereq: 16.842, 16.851, or permission of instructor
G (Spring)
4·2·6 units
See description under subject 16.89[J].
E. F. Crawley

IDS.340[J] System Safety Concepts
Same subject as 16.863[J]
Prereq: Permission of instructor
G (Fall)
3·0·9 units
See description under subject 16.863[J]. Enrollment may be limited.
N. G. Leveson

IDS.341[J] Concepts in the Engineering of Software
Same subject as 16.355[J]
Prereq: Permission of instructor
G (Spring)
3·0·9 units
See description under subject 16.355[J]. Enrollment may be limited.
N. G. Leveson

IDS.350[J] Cybersecurity
Same subject as 17.448[J], MAS.660[J]
Subject meets with 17.447[J], IDS.050[J], MAS.460[J]
Prereq: Permission of instructor
G (Spring)
3·0·9 units
See description under subject 17.448[J].
N. Choucri, S. Pentland
IDS.405 Critical Internet Studies (CMS.867)
Subject meets with 21W.791[J], CMS.614[J], WGS.280[J]
Prereq: None
G (Spring)
3-0-9 units
Focuses on the power dynamics in internet-related technologies (including social networking platforms, surveillance technology, entertainment technologies, and emerging media forms). Theories and readings focus on the cultural, social, economic, and political aspects of internet use and design, with a special attention to gender and race. Topics include: online communication and communities, algorithms and search engines, activism and online resistance, surveillance and privacy, content moderation and platform governance, and the spread of dis- and misinformation. Instruction and practice in written and oral communication provided. Students taking the graduate version complete additional readings and assignments.

Staff

IDS.410 Modeling and Assessment for Policy
Prereq: None
Acad Year 2024-2025: G (Spring)
Acad Year 2025-2026: Not offered
3-0-6 units
Explores how scientific information and quantitative models can be used to inform policy decision-making. Develops an understanding of quantitative modeling techniques and their role in the policy process through case studies and interactive activities. Addresses issues such as analysis of scientific assessment processes, uses of integrated assessment models, public perception of quantitative information, methods for dealing with uncertainties, and design choices in building policy-relevant models.
N. E. Selin

IDS.411 Concepts and Research in Technology and Policy
Prereq: Permission of instructor
G (Spring)
3-0-6 units
Core integrative subject, with substantive participation from a series of guest faculty lecturers, examines key technology-policy concepts. Explores alternative framings of roles of technology in policy, emphasizing the implications of these alternatives upon problem-solving in the area. Exercises prepare students to apply these concepts in the framing of their thesis research. Preference to first-year students in the Technology and Policy Program.
F. Field

IDS.412[J] Science, Technology, and Public Policy
Same subject as 17.310[J], STS.482[J]
Prereq: Permission of instructor
G (Fall)
4-0-8 units
Credit cannot also be received for 17.309[J], IDS.055[J], STS.082[J]
See description under subject 17.310[J].
N. Selin

IDS.435[J] Law, Technology, and Public Policy
Same subject as 11.422[J], 15.655[J]
Subject meets with 11.122[J], IDS.066[J]
Prereq: None
G (Fall)
3-0-9 units
Examines how law, economics, and technological change shape public policy, and how law can sway technological change; how the legal system responds to environmental, safety, energy, social, and ethical problems; how law and markets interact to influence technological development; and how law can affect wealth distribution, employment, and social justice. Covers energy/climate change; genetic engineering; telecommunications and the role of misinformation; industrial automation; effect of regulation on technological innovation; impacts of antitrust law on innovation and equity; pharmaceuticals; nanotechnology; cost/benefit analysis as a decision tool; public participation in governmental decisions affecting science and technology; corporate influence on technology and welfare; and law and economics as competing paradigms to encourage sustainability. Students taking graduate version explore subject in greater depth.
N. Ashford, C. C. Caldart

Same subject as 10.805[J]
Subject meets with 1.802[J], 1.812[J], 11.022[J], 11.631[J], IDS.061[J], IDS.541[J]
Prereq: Permission of instructor
G (Spring)
Not offered regularly; consult department
3-0-6 units
Addresses relationship between technology-related problems and the law applicable to work environment. National Labor Relations Act, Occupational Safety and Health Act. Toxic Substances Control Act, state worker’s compensation, and suits by workers in the courts discussed. Problems related to occupational health and safety, collective bargaining as a mechanism for altering technology in the workplace, job alienation, productivity, and the organization of work addressed. Prior courses or experience in the environmental, public health, or law-related areas.
N. A. Ashford, C. C. Caldart

Institute for Data, Systems, and Society | 15
IDS.437[J] Technology, Globalization, and Sustainable Development
Same subject as 1.813[J], 11.466[J], 15.657[J]
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Investigates sustainable development, taking a broad view to include not only a healthy economic base, but also a sound environment, stable and rewarding employment, adequate purchasing power and earning capacity, distributional equity, national self-reliance, and maintenance of cultural integrity. Explores national, multinational, and international political and legal mechanisms to further sustainable development through transformation of the industrial state. Addresses the importance of technological innovation and the financial crisis of 2008 and the emergence of the Covid-19 pandemic, Russia’s invasion of Ukraine, and inflation, as well as governmental interventions to reduce inequality.
N. Ashford

IDS.448 Professional Development: Policy Hackathon
Prereq: None
G (Fall)
2-0-4 units
Bridges knowledge to action for student organizers of the MIT Policy Hackathon. Students work with stakeholders to define needs for information and analysis, identify appropriate data sets, and craft problem statements that aim to provide actionable outputs for decision-making. Builds competence in management and organization, networking, presentation, and fundraising. Restricted to the student organizers for the MIT Policy Hackathon.
F. Field, N. E. Selin

IDS.449 Technology Policy Internship and Professional Perspectives Seminar
Prereq: IDS.411 or permission of instructor
G (Fall, Spring)
1-1-1 units
Can be repeated for credit.
Seminar examines what technology policy is in practice. Considers the question of "Who achieves what, when, how, and why?" regarding technology and policy. Students who completed summer internships present and dissect their experiences with special reference to specific cases in which they participated. Develops perspectives on practice in the field through sessions with alumni, other practitioners, and development professionals within MIT.
Staff

IDS.505[J] Engineering, Economics and Regulation of the Electric Power Sector
Same subject as 15.032[J]
Prereq: None
G (Spring)
3-0-9 units
Presents an in-depth interdisciplinary look at the electric power sector, with regulation providing the link among engineering, economic, legal and environmental viewpoints. Topics include electricity markets, incentive regulation of networks, service reliability, renewable energy sources, network issues, retail competition, tariff design, distributed generation, rural electrification, multinational electricity markets, environmental impacts, and the future of utilities and strategic sustainability issues under traditional and competitive regulatory frameworks. Covers engineering, economic and legal basis to evaluate worldwide regulatory instruments. Regulatory approaches apply in other industrial sectors such as fuel gases, telecoms, transportation, water supply. Provides the basis for research or professional activities in energy sectors in industry, government, and consulting. Permission of instructor required for undergraduates wishing to take the class.
C. Batlle-Lopez, T. Schittekatte

IDS.521[J] Energy Systems for Climate Change Mitigation
Same subject as 1.670[J], 10.621[J]
Subject meets with 1.067[J], 10.421[J], IDS.065[J]
Prereq: Permission of instructor
G (Fall)
3-0-9 units
Reviews the contributions of energy systems to global greenhouse gas emissions, and the levers for reducing those emissions. Lectures and projects focus on evaluating energy systems against climate policy goals, using performance metrics such as cost, carbon intensity, and others. Student projects explore pathways for realizing emissions reduction scenarios. Projects address the climate change mitigation potential of energy technologies (hardware and software), technological and behavioral change trajectories, and technology and policy portfolios. Background in energy systems strongly recommended. Students taking the graduate version complete additional assignments and explore the subject in greater depth.
J. Trancik
IDS.522 Mapping and Evaluating New Energy Technologies
Prereq: Permission of instructor
G (Fall)
3-0-9 units

Project-based seminar reviews recent developments in energy conversion and storage technologies. Merits of alternative technologies are debated based on their environmental performance and cost, and their potential improvement and scalability. Project teams develop qualitative insights, quantitative models, and interactive visualization tools to inform the future development of technologies. Models may probe how the impact of a technology depends on assumptions about future advancements in performance, and how quantitative performance targets can be estimated to inform investment and design decisions. Other projects may develop models to inform rational investments in a portfolio of technologies based on economic and environmental performance and scalability constraints. Both information-based (e.g., software and codified practices) and physical technologies will be discussed.

J. Trancik

IDS.524[J] People and the Planet: Environmental Histories and Engineering
Same subject as 11.204[J]
Subject meets with 11.004[J], STS.033[J]
Prereq: None
G (Spring)
Not offered regularly; consult department
3-3-6 units

See description under subject 11.204[J].

A. Slocum, R. Scheffler, J. Trancik

IDS.526[J] Sustainability Science and Engineering
Same subject as 12.845[J]
Prereq: None
G (Fall)
Not offered regularly; consult department
3-0-6 units

Introduces and develops core ideas and concepts in the field of sustainability science and engineering from an engineering systems perspective. Takes an interdisciplinary approach to discuss case studies of sustainability systems research. Exposes students to techniques for sustainability research across engineering, natural and social science disciplines. Term projects focus on applying techniques.

N. E. Selin

IDS.540[J] Environmental Law, Policy, and Economics: Pollution Prevention and Control
Same subject as 1.811[J], 11.630[J], 15.663[J]
Subject meets with 1.801[J], 11.021[J], 17.393[J], IDS.060[J]
Prereq: None
G (Spring)
3-0-9 units

Analyzes federal and state regulation of air and water pollution, hazardous waste, greenhouse gas emissions, and production/use of toxic chemicals. Analyzes pollution/climate change as economic problems and failure of markets. Explores the role of science and economics in legal decisions. Emphasizes use of legal mechanisms and alternative approaches (i.e., economic incentives, voluntary approaches) to control pollution and encourage chemical accident and pollution prevention. Focuses on major federal legislation, underlying administrative system, and common law in analyzing environmental policy, economic consequences, and role of the courts. Discusses classical pollutants and toxic industrial chemicals, greenhouse gas emissions, community right-to-know, and environmental justice. Develops basic legal skills: how to read/understand cases, regulations, and statutes. Students taking graduate version explore the subject in greater depth.

N. Ashford, C. Caldart

IDS.541[J] Regulation of Chemicals, Radiation, and Biotechnology
Same subject as 1.812[J], 11.631[J]
Subject meets with 1.802[J], 10.805[J], 11.022[J], IDS.061[J], IDS.436[J]
Prereq: IDS.540[J] or permission of instructor
G (Spring)
Not offered regularly; consult department
3-0-9 units

Focuses on policy design and evaluation in the regulation of hazardous substances and processes. Includes risk assessment, industrial chemicals, pesticides, food contaminants, pharmaceuticals, radiation and radioactive wastes, product safety, workplace hazards, indoor air pollution, biotechnology, victims' compensation, and administrative law. Health and economic consequences of regulation, as well as its potential to spur technological change, are discussed for each regulator regime. Students taking the graduate version are expected to explore the subject in greater depth.

N. Ashford, C. Caldart
IDS.620[J] Principles and Practice of Drug Development
Same subject as 10.547[J], 15.136[J], HST.920[J]
Prereq: Permission of instructor
G (Fall)
3-0-6 units
See description under subject 15.136[J].
S. Finkelstein, A. J. Sinskey, R. Rubin

IDS.670[J] Planning and Design of Airport Systems
Same subject as 1.231[J], 16.781[J]
Prereq: None
Acad Year 2024-2025: G (Spring)
Acad Year 2025-2026: Not offered
3-0-9 units
Focuses on current practice, developing trends, and advanced concepts in airport design and planning. Considers economic, environmental, and other trade-offs related to airport location, as well as the impacts of emphasizing “green” measures. Includes an analysis of the effect of airline operations on airports. Topics include demand prediction, determination of airfield capacity, and estimation of levels of congestion; terminal design; the role of airports in the aviation and transportation system; access problems; optimal configuration of air transport networks and implications for airport development; and economics, financing, and institutional aspects. Special attention to international practice and developments.
R. de Neufville, A. R. Odoni

IDS.675[J] Transportation: Foundations and Methods
Same subject as 1.200[J], 11.544[J]
Subject meets with 1.041[J], IDS.075[J]
Prereq: 1.000, (1.00 and 1.010), or permission of instructor
G (Spring)
3-1-8 units
See description under subject 1.200[J].
C. Wu

Same subject as 1.203[J], 15.073[J]
Prereq: 6.3700 or 18.600
G (Fall)
Not offered regularly; consult department
3-0-9 units
See description under subject 15.073[J].
A. Barnett

IDS.730[J] Logistics Systems
Same subject as 1.260[J], 15.770[J], SCM.260[J]
Subject meets with SCM.271
Prereq: Permission of instructor
G (Fall)
3-0-9 units
See description under subject SCM.260[J].
C. Caplice, D. Correll

IDS.735[J] Supply Chain Analytics
Same subject as 1.273[J], 15.762[J]
Prereq: 15.761 or SCM.260[J]
G (Spring)
3-0-9 units
See description under subject 15.762[J].
N. Trichakis, S. Willems

IDS.736[J] Supply Chain: Capacity Analytics
Same subject as 1.274[J], 15.763[J]
Prereq: 15.761, 15.778, or SCM.260[J]
G (Spring; second half of term)
Not offered regularly; consult department
2-0-4 units
See description under subject 15.763[J].
S. Graves, N. Trichakis, S. Willems

IDS.900 Doctoral Seminar in Social and Engineering Systems
Prereq: Permission of instructor
G (Fall)
2-0-1 units
Introduces doctoral students to IDSS research areas. Preference to first-year students in SES.
A. Jadbabaie

IDS.910 Leadership Development
Prereq: Permission of instructor
G (Fall; partial term)
Not offered regularly; consult department
1-1-1 units
Seminar environment created to develop leadership capabilities, and to take advantage of leadership opportunities. An initial Outward Bound experience builds trust, teamwork and communications. Readings and assignments emphasize the characteristics of desired leadership skills. Global leaders participate in the Leadership Lunch series to share their experiences and recommendations. Discussions explore leadership development. Culminates in a personal leadership plan. Restricted to entering students in the Technology and Policy program or instructor permission.
Staff
IDS.950 Independent Study in Data, Systems, and Society
Prereq: Permission of IDSS Academic Office
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

For graduate students in IDSS. Individual study in data, systems, and society. Intended to expose student to expert-level domain material. Supervised by a member of MIT’s teaching staff. 
Consult IDSS Academic Office

IDS.951 Independent Study in Technology and Policy
Prereq: Permission of TPP Education Office
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

For graduate students in TPP. Individual study in technology and policy. Intended to expose student to expert-level domain material. Supervised by a member of MIT’s teaching staff. 
Consult TPP Education Office

IDS.955 Practical Experience in Data, Systems, and Society
Prereq: None
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

For IDSS doctoral students participating in off-campus practical experiences in data, systems, and society. Before registering for this subject students must have a training offer from a company or organization, must identify a research advisor, and must receive prior approval from the IDSS Academic Office. Upon completion of the experience students must submit a letter from the company or organization describing the goals accomplished and a substantive final report to the MIT advisor. 
Consult IDSS Academic Office

IDS.956 Practical Experience in Technology and Policy
Prereq: None
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

For TPP students participating in off-campus internship experiences in technology and policy. Before registering for this subject, students must have an employment offer from a company or organization, must identify a research advisor, and must receive prior approval from the TPP Education Office. Upon completion of the internship, student must submit a letter from the employer describing the work accomplished, along with a substantive final report from the student approved by the MIT advisor. 
Consult TPP Education Office

IDS.957 Practical Experience in Data Analysis
Prereq: None
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

For doctoral students in the Interdisciplinary Doctoral Program in Statistics participating in off-campus practical experiences in data analysis in programs where practical experience is accepted. Before registering for this subject students must have a training offer from a company or organization, must identify a research advisor, and must receive prior approval from the IDSS Academic Office. Upon completion of the experience, students must submit a letter from the company or organization describing the goals accomplished and a substantive final report to the MIT advisor discussing how data science and statistical tools were used during their experience and any interesting problems, applications, or results. 
E. Milnes

IDS.960 Teaching in Data, Systems, and Society
Prereq: None
G (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

For Teaching Trainees in IDSS. Laboratory, tutorial, or classroom teaching under supervision of a faculty member. Restricted to doctoral students in IDSS who have completed requisite modules and training. 
Consult IDSS Academic Office

IDS.961 Teaching in Technology and Policy
Prereq: None
G (Fall, IAP, Spring)
Units arranged [P/D/F]
Can be repeated for credit.

For Teaching Assistants in TPP, in cases where teaching assignment is approved for academic credit. Laboratory, tutorial, or classroom teaching under supervision of a faculty member. Credit for this subject may not be used for any degree granted by IDSS. 
Consult TPP Academic Office
IDS.970 Pre-Thesis Research in Data, Systems, and Society
Prereq: None
G (Fall, Spring, Summer)
Units arranged
Can be repeated for credit.
For doctoral students defining their dissertation topic in IDSS. Covers all activities leading to an acceptable thesis proposal and approved for academic credit by the student's academic program. Includes identifying a research advisor and program planning. Culminates in a thesis proposal, approved by a complete doctoral committee, with working title, abstract, problem summary, significance, literature review, approach, timeline, and references. Academic advisor monitors student progress until a research advisor is identified. Restricted to doctoral students in IDSS. Consult IDSS Academic Office

IDS.971 Research in Technology and Policy
Prereq: None
G (Fall, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.
For research assistants in TPP when assigned research is not used for thesis, but is approved for academic credit. Credit for this subject may not be used for any degree granted by IDSS. Consult TPP Academic Office

IDS.C57[J] Optimization Methods (New)
Same subject as 6.C57[J], 15.C57[J]
Subject meets with 6.C571[J], 15.C571[J]
Prereq: 18.C06[J] or permission of instructor
G (Fall)
4-0-8 units
See description under subject 15.C57[J].
A. Jacquillat

IDS.500 Special Undergraduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
U (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of topics in Data, Systems, and Society not otherwise included in the curriculum. Offerings initiated by faculty on an ad-hoc basis subject to IDSS approval. Consult IDSS Academic Office

IDS.501 Special Undergraduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
U (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval. Consult IDSS Academic Office

IDS.510 Special Undergraduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
U (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.
Opportunity for study of topics in Data, Systems, and Society not otherwise included in the curriculum. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval. Consult IDSS Academic Office

IDS.511 Special Undergraduate Subject in Data, Systems, and Society
Prereq: None
U (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.
Opportunity for study of topics in Data, Systems, and Society not otherwise included in the curriculum. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval. Consult IDSS Academic Office

IDS.520 Special Graduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval. Consult IDSS Academic Office
IDS.S21 Special Graduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Information: Consult IDSS Academic Office

IDS.S22 Special Graduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Consult IDSS Academic Office

IDS.S23 Special Graduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
G (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Consult IDSS Academic Office

IDS.S24 Special Graduate Subject in Data, Systems, and Society
Prereq: Permission of instructor
G (Fall, Spring)
Not offered regularly; consult department
Units arranged
Can be repeated for credit.
Opportunity for study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Consult IDSS Academic Office

IDS.S30 Special Graduate Subject in Data, Systems, and Society
Prereq: None
G (Summer)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.
Opportunity for study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Staff

IDS.S31 Special Graduate Subject in Data, Systems, and Society
Prereq: None
G (Fall, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.
Opportunity for individual or group study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Consult IDSS Academic Office

IDS.S32 Special Graduate Subject in Data, Systems, and Society
Prereq: None
G (Fall, IAP, Spring, Summer)
Not offered regularly; consult department
Units arranged [P/D/F]
Can be repeated for credit.
Opportunity for individual or group study of advanced topics in Data, Systems, and Society not otherwise included in the curriculum at MIT. Offerings are initiated by faculty on an ad-hoc basis subject to IDSS approval.
Consult IDSS Academic Office

IDS.THG Graduate Thesis
Prereq: IDS.970 or permission of instructor
G (Fall, IAP, Spring, Summer)
Units arranged
Can be repeated for credit.
Program of research, leading to the writing of an SM or PhD thesis to be arranged by the student with a member of the IDSS faculty. A minimum of 24 thesis units are required for the SM degree. Doctoral students must first complete IDS.970.
Consult IDSS Academic Office
**IDS.UR Undergraduate Research**
Prereq: None
U (Fall, IAP, Spring, Summer)
Units arranged [P/D/F]
Can be repeated for credit.

Undergraduate research opportunities in Data, Systems, and Society.
*IDSS Academic Office*

**IDS.URG Undergraduate Research**
Prereq: None
U (Fall, IAP, Spring, Summer)
Units arranged
Can be repeated for credit.

Undergraduate research opportunities in Data, Systems, and Society.
*Consult IDSS Academic Office*