

# DECISION SCIENCES

## Lam Family College of Business

Dean: Dr. Eugene Sivadas

### Department of Decision Sciences

BUS 310

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Chair: Dr. Julia Miyaoka

Undergraduate Advisors: Bollapragada, Cholette, Cheung, Eng, Hasheminia, Liu, Miyaoka, Ozsen, Roeder, Saltzman, Soorapanth, Zhao

### Professor

RAMESH BOLLAPRAGADA (2002), *Professor of Decision Sciences*; B. Tech. (1988), India; M.S. (1993), Ph.D. (1996), Carnegie Mellon University.

JAMIE PEARL ENG (1981), *Professor of Decision Sciences*; B.S. (1973), Massachusetts Institute of Technology; M.S., Sc.D. (1977), Harvard University.

ROBERT M. SALTZMAN (1989), *Professor of Decision Sciences*; B.S. (1981), Brown University; M.S. (1986), Ph.D. (1989), Stanford University.

### Associate Professor

SUSAN CHOLETTE (2002), *Associate Professor of Decision Sciences*; B.S.E. (1989), Princeton University; Ph.D. (1996), Stanford University.

HAMED HASHEMINIA (2013), *Associate Professor of Decision Sciences*; B.Sc. (2003), University of Tehran; M.Sc. (2005), Sharif University of Technology; M.A. (2007), University of British Columbia; Ph.D. (2012), University of British Columbia.

JULIA MIYAOKA (2003), *Associate Professor of Decision Sciences*; B.S. (1988), California Polytechnic State University, San Luis Obispo; M.S. (1991), Ph.D. (2003), Stanford University.

ÖZGÜR ÖZLUK (2002), *Associate Professor of Decision Sciences*; B.S. (1994), Bilkent University, Turkey; M.S. (1997), Ph.D. (1999), University of North Carolina, Chapel Hill.

LEYLA OZSEN (2008), *Associate Professor of Decision Sciences*; B.S. (1997), Cornell University; M.S. (1999), Stanford University; Ph.D. (2004), Northwestern University.

THERESA ROEDER (2005), *Associate Professor of Decision Sciences*; B.S. (1997), M.S. (1999), Case Western Reserve University; M.S. (2001), Ph.D. (2002), University of California, Berkeley.

SADA SOORAPANTH (2005), *Associate Professor of Decision Sciences*; BENG (1992), Chulalongkorn University, Bangkok, Thailand; M.S. (1995), The University of Houston; Ph.D. (2002), The University of Michigan.

YABING ZHAO (2015), *Associate Professor of Decision Sciences*; B.S. (2007), Tongji University, China; Ph.D. (2015), The State University of New York at Buffalo.

### Major

- Bachelor of Sciences in Business Administration: Concentration in Decision Sciences (<http://bulletin.sfsu.edu/colleges/business/>)

decision-sciences/bs-business-administration-concentration-decision-sciences/)

### Minor

- Minor in Decision Sciences (<http://bulletin.sfsu.edu/colleges/business/decision-sciences/minor-decision-sciences/>)

#### DS 110 Calculus with Business Applications (Units: 3)

Prerequisites: Category I or II placement for QR/Math, or satisfactory completion of ELM requirement, or MATH 70 or ESM 70 with a grade of C or better.

Basic quantitative reasoning and employment of fundamental mathematical principles to solve business problems. Elements of calculus, mathematics of finance, and decision-making. (Note: In order for this course to satisfy General Education, students must earn a C- or CR or higher grade if taken fall 2014 or later.)

#### Course Attributes:

- B4: Math/QR

#### DS 199 Decision Sciences Make-Up (Unit: 1)

Prerequisite: Consent of the instructor.

Additional study to make-up for partial equivalents in Decision Sciences courses. May be repeated for a total of 2 units.

#### DS 212 Business Statistics I (Units: 3)

Prerequisites: DS 110\* or MATH 110\* or MATH 226\* or MATH 108\* with grades of C- or better.

Statistical methods essential in solving business problems including probability distributions, estimation and tests of hypotheses, and regression analysis.

#### DS 312 Data Analysis with Computer Applications (Units: 3)

Prerequisite: DS 212.

Interpretation and presentation of data with business applications using statistical software packages. Multiple regression, sampling techniques, design and analysis of surveys, analysis of variance, experimental design, and contingency tables. (Plus-minus letter grade only)

#### DS 408 Computer Simulation (Units: 3)

Prerequisites: DS 212; ISYS 263 or passing the waiver exam in basic computer proficiency and information systems.

Development of computer-based simulation modeling skills, focusing on managerial cases. Experience with professional simulation software. Model formulation, execution, and interpretation of results. (Plus-minus letter grade only)

#### DS 411 Decision Modeling for Business (Units: 3)

Prerequisites: DS 110\*, DS 212\*, ISYS 263\* with grades of C- or better. (ISYS 263 may be satisfied by passing the waiver exam in basic computer proficiency and information systems.)

Basic concepts of spreadsheet modeling and risk analysis with applications to practical business decision making. Topics include cost and demand modeling, risk analysis, revenue (yield) management, and implementation of decision models using spreadsheets. (This class cannot be taken after DS 601 and is not applicable towards the DS major or minor.)

**DS 412 Operations Management (Units: 3)**

Prerequisites: DS 110\* or MATH 108\* or MATH 110\* or MATH 226\*; DS 212\* or ISED 160\* or MATH 124\*; ISYS 263\*; all with grades of C- or better. (ISYS 263 may be satisfied by passing the waiver exam in basic computer proficiency and information systems.)

Management of manufacturing and service operations. Use of computer-based models. Forecasting, capacity planning, linear programming, inventory management, quality management, and project management.

**DS 412SI Supplemental Instruction: Operations Management (Unit: 1)**

Prerequisite: Concurrent enrollment in DS 412.

Student-centered discussion and problem-solving designed to promote understanding of key concepts and enhance student success in DS 412. May be repeated for a total of 3 units. Activity. (ABC/NC grading, CR/NC allowed)

**DS 601 Applied Management Science (Units: 3)**

Prerequisites: DS 110 and DS 212; ISYS 263 or passing the waiver exam in basic computer proficiency and information systems.

Decision making in business emphasizing computer applications. Development of spreadsheet modeling skills and the use of professional software. (Plus-minus letter grade only)

**DS 604 Applied Business Forecasting (Units: 3)**

Prerequisites: ISYS 263 (may be satisfied by passing the waiver exam in basic computer proficiency and information systems), DS 212, and DS 412; or consent of the instructor.

Business forecasting methodology and applications including quantitative and qualitative approaches to short-, medium-, and long-range forecasting. Practical aspects of forecasting within the business environment. Interrelationships with business planning. (Plus-minus letter grade only)

**DS 612 Data Mining with Business Applications (Units: 3)**

Prerequisite: DS 312 or DS 604 with a grade of C- or better.

Concepts of modeling and understanding of complex datasets based on advanced statistical methods. Discussion of various supervised and unsupervised learning techniques. Instruction in the use of statistical software such as R, SAS, Stata, etc. (Plus-minus letter grade only)

**DS 624 Quality Management (Units: 3)**

Prerequisites: DS 212; ISYS 263 or passing the waiver exam in basic computer proficiency and information systems.

Concepts, methods, and current practices ensuring product and service quality. Applications in manufacturing and service industries: quality as a system, customer-driven quality, continuous process improvement, implementation approaches, and ethical issues. (Plus-minus letter grade only)

**DS 655 Sustainable Supply Chain Management (Units: 3)**

Prerequisite: DS 412.

Design and management of supply chains, cost-effectiveness, environmental and social responsibility. Includes global facility and network design, aggregate planning, transportation, inventory management. (Plus-minus letter grade only)

**DS 660GW Communications for Business Analytics - GVAR (Units: 3)**

Prerequisites: Decision Sciences majors and minors; GE Area A2; DS 412 and at least two DS electives, one of which may be taken concurrently.

Capstone course in Decision Sciences. Communication standards, supply chain management, quality, ethics, and sustainability. Focus on quantitative analysis and communication. Use of computer-based models. (ABC/NC grading only)

**Course Attributes:**

- Graduation Writing Assessment

**DS 699 Independent Study (Units: 1-3)**

Prerequisite: Consent of the instructor, adviser, and department chair.

Intensive problem analysis under the direction of a decision sciences faculty member. Open only to upper division students who have demonstrated the ability to do independent work.

**DS 767 Decision Sciences Internship (Units: 1-3)**

Prerequisites: Restricted to graduate Business students; one 800-level DS course; completed application form; consent of the instructor.

Provides the opportunity to participate in a semester of field experience. A major report is required. May not be used on ATC. (CR/NC grading only)

**DS 816 Seminar in Business Forecasting (Units: 3)**

Prerequisites: Restricted to graduate Business students; BUS 786; or consent of the instructor; graduate students in other majors admitted with the consent of the Faculty Director of Graduate Programs.

Theory and practice of short, medium, and long-range forecasting within business environments. Quantitative and qualitative forecasting methods. Mathematical methods covered include time series models, decomposition models, linear and multiple regression models, and may include ARIMA and data mining. (Plus-minus letter grade only)

**DS 851 Computer Simulation and Decision-Making (Units: 3)**

Prerequisite: Restricted to graduate Business students; BUS 786 or consent of the instructor; graduate students in other majors with the consent of the Faculty Director of Graduate Programs.

Design and use of computer simulation models in business decision-making. Application to selected problems in various areas of business. (Plus-minus letter grade only)

**DS 852 Managerial Decision Making (Units: 3)**

Prerequisites: Restricted to graduate Business students; BUS 786; graduate students in other majors admitted with the consent of the Faculty Director of Graduate Programs.

Model building for business decision making through data-driven analysis. Creation of spreadsheet models to identify choices, formalize trade-offs, specify constraints, perform sensitivity analyses, and analyze the impact of uncertainty. Effective spreadsheet design and use. (Plus-minus letter grade only.)

**DS 853 Applied Multivariate Analysis (Units: 3)**

Prerequisites: Restricted to graduate Business students; BUS 776; concurrent enrollment in ISYS 812; or consent of the instructor; graduate students in other majors admitted with the consent of the Faculty Director of Graduate Programs.

Methods of multivariate data analysis applied to business problems. Mathematical methods covered include simple and multiple regression models, logistic regression models, and time series analysis. Theory and practice within business environments. Project using real data. (Plus-minus letter grade only)

**DS 855 Supply Chain Management (Units: 3)**

Prerequisites: Restricted to graduate Business students; BUS 786; or consent of the instructor; graduate students in other majors admitted with the consent of the Faculty Director of Graduate Programs.

Supply chain design, planning, and operation. Concepts of competitive strategy and sustainability; aggregate planning and management of the marketing/operations interface; inventory management and procurement strategy; design of supply chain networks; the role of information technology. (Plus-minus letter grade only)

**DS 856 Seminar in Project Management (Units: 3)**

Prerequisites: Restricted to graduate Business students; BUS 786; or consent of the instructor; graduate students in other majors admitted with the consent of the Faculty Director of Graduate Programs.

The full range of issues faced by project managers. The project life cycle; technical, human, and organizational issues; planning, scheduling, and controlling the timing, resources, and costs of a project; software usage; case studies. (Plus-minus letter grade only)

**DS 861 Data Mining and Advanced Statistical Methods for Business Analysts (Units: 3)**

Prerequisites: Restricted to graduate business students; DS 853\* and ISYS 812\*; graduate students in other programs admitted with the consent of the Faculty Director of Graduate Programs.

Focus on concepts of modeling and understanding of complex datasets based on advanced statistical methods with various supervised and unsupervised learning techniques. Includes an overview of relevant algorithms while emphasizing business applications of these tools and statistical software commonly used in practice, such as R, Python, SAS, Stata, etc. (Plus-minus letter grade) [Formerly DS 812]

**DS 862 Machine Learning for Business Analysts (Units: 3)**

Prerequisites: Restricted to graduate Business students; DS 861\*; graduate students in other programs permitted with the consent of the Faculty Director of Graduate Programs.

Focus on advanced machine learning methods including supervised and unsupervised learning techniques used to extract valuable information from quantitative and text data. Includes an overview of relevant algorithms while emphasizing business applications of the tools with a focus on commonly-used statistical software, e.g., R and Python, and how to apply the techniques learned in class. (Plus-minus letter grade)

**DS 899 Independent Study (Units: 1-3)**

Prerequisites: Restricted to graduate Business students; consent of the instructor, adviser, and department chair; open only to graduate students who demonstrate the ability to work independently.

Intensive study of a particular problem under the direction of a business analysis faculty member. (Plus-minus letter grade only)