INFORMATION SYSTEMS AND DECISION SCIENCES • ISDS

1100 Introduction to Management Information Systems (3) Management of information, computers, and systems; utilization of management information systems to improve managerial decision making.

2000 Statistical Methods and Models I (3) Prereq.: MATH 1431 and ISDS 1100. Statistical description and inference; data distributions, descriptive measures, index numbers, time series analysis; review and extension of probability theory; probability distributions; standard distributions, including normal and binomial; sampling distributions.


3000 Statistical Methods and Models III (3) Prereq.: ISDS 2001. Continuation of ISDS 2001. Statistical inference; additional applications of sampling distribution; the chi-square, student's t, and F distributions; estimation; hypothesis testing; survey sampling; linear regression; simple correlation; analysis of variance; nonparametric tests.

3001 Conceptual Foundation for Statistical Analysis (3) Prereq.: MATH 1021 or equivalent. Foundations for advanced work in statistical inference; probability, probability distributions, expected value, sampling distributions; application of sampling distributions to problems of estimation and control.

3002 Conceptual Foundations for Operations Research (3) Prereq.: MATH 1021 or equivalent. Not open to undergraduate students in the E. J. Ourso College of Business Administration. Foundations for work in operations research; fundamentals of analysis, systems of linear equations, selected topics from matrix algebra.

3070 Independent Reading and Research in Information Systems and Decision Sciences (1-6) Prereq.: ISDS 3100 and consent of instructor. May be taken for a max. of 6 sem. hrs. of credit. Student is responsible for registering with a faculty member and selecting an area of reading and/or research.

3075 Internship in Information Systems and Decision Sciences (3) Prereq.: permission of instructor and department chair required. Pass/fail grading. At least the equivalent of 144 hours per semester (3 credits) of learning experience in information systems under the general supervision of an ISDS faculty member and direct supervision of an information systems decision sciences professional. Grading based on the faculty member's evaluation, a written report by the professional supervisor, and a written report by the student.

3100 Management of Information Resources (3) Prereq.: ISDS 1100. Information as a resource; issues in information resource management; elements of information systems; development and maintenance of information systems; controlling information resources.

3105 Internet Development Tools (3) Prereq.: ISDS 1100 and grade of "C" or better in CSC 1250 or equivalent. Understanding of the Internet and its structure for use of basic encryption technologies employed to develop Internet applications; development of business Internet applications.

3110 Database Processing for Management (3) Prereq.: ISDS 3100. Structure and function of managerial databases; design options and implementation of database management systems in the firm; laboratory practice includes use of a particular software system.

3115 Introduction to Operations Management (3) Prereq.: ISDS 2001. Principles and methodologies concerning productivity and quality of manufacturing and service organizations; production and service systems design; process and capacity design; total quality management; systems for just-in-time and purchasing management; inventory and materials management.


4000 Introduction to Statistical Theory (3) Prereq.: proficiency in basic statistical methods and MATH 1552, or consent of instructor. Concepts of probability distribution and statistical inference; theoretical foundations for estimating and testing hypotheses about means, proportions, and variances; chi-square and F tests.

4070 Applied Nonparametric Statistics (3) Prereq.: ISDS 3000 or equivalent. Applied nonparametric statistics including techniques for one-sample problems, comparisons of two treatments, paired comparisons, randomized complete blocks, comparison of more than two treatments, tests of randomness and independence, and measures of correlation.

4073 Bayesian Probability and Statistical Methods (3) Prereq.: ISDS 3000 or equivalent. Assessment of subjective probability distributions; Bayesian estimation and inference, application of Bayesian techniques to business problems.

4080 Operations Research for Managerial Decisions (3) Prereq.: ISDS 2001 or equivalent. Managerial decision making, including decision analysis, linear programming, transportation models, integer programming, project scheduling, and waiting line models; basic understanding and evaluation of operations research techniques.

4090 Foundations of Mathematical Programming (3) Prereq.: credit or registration in ISDS 4020. Theoretical foundations of linear programming in single and multiple objectives; classical nonlinear optimization of unconstrained and constrained functions; Kuhn-Tucker conditions and quadratic programming.

4091 Applied Linear Models (3) Prereq.: ISDS 3000 or equivalent. Development of a unified approach to estimation and hypothesis testing in linear statistical models; emphasis on appropriate specification and interpretation of models and statistical hypothesis; use of available computer routines and interpretation of results; balanced and unbalanced analysis of variance models, linear regression models, and analysis of covariance models.

4100 Business Decision Support and Expert Systems (3) Prereq.: ISDS 3110 or equivalent. Laboratory practice includes use of a particular software system. Business decision modeling; constructing a decision support system (DSS); DSS development tools; executive information systems; expert systems (ES) in business; building ES; process, tools, and strategy; integration of DSS and ES.

4110 Enterprise Systems (3) Prereq.: ISDS 3100. Overview of key enterprise systems concepts from functional, technical, and implementation perspectives; emphasis on the process-oriented organization and how integrated systems are designed to support cross-functional business; hands-on computer-based exercises involving a hypothetical global company.

4112 Data Warehousing (3) Prereq.: ISDS 3100. Data Warehouses for business; topics include: top-down design, bottom-up design, data charts, multidimensional data, data marts, data warehouse, knowledge management.

4113 Information Technology Project Management (3) Prereq.: ISDS 3100 or equivalent. Topics on effectively managing information technology projects including: setting goals and objectives; work breakdown structures; project scheduling; managing project resources; evaluation and review; incentives and qualitative analysis; project accounting; extensive use of cases involving hands-on computer analyses with state-of-the-art project management software.

4114 Software Quality Assurance (3) Prereq.: ISDS 3100. Modern practices of software quality management; topics include: software development process models, software quality metrics, basic quality tools, software reliability models, customer satisfaction measures, and the ISO 9000 quality standard.

4120 Business Data Communications (3) Prereq.: ISDS 3100 or equivalent. Telecommunications in business, including both voice and data communication, technical details (hardware, software, protocols, network configurations), network management, and security issues.

4125 Analysis and Design of Management Information Systems (3) Prereq.: ISDS 3110, 3200. Design philosophies and techniques for the creation of information systems for management decision making; conceptual design of actual information systems.

4141 Introduction to Data Mining (3) Prereq.: ISDS 3400. Fundamental methodology and techniques used in data mining, with particular emphasis on business applications; topics include market basket analysis, memory-based reasoning, cluster detection, link analysis, decision trees and rule induction, neural networks, and genetic algorithms.

4155 Operation of Service and Distribution Systems (3) Prereq.: ISDS 3115. Application of operations management concepts and techniques in service and distribution organizations; service system design and control, including location, layout, capacity expansion, staffing and scheduling; special attention to structure design.
and operational control of distribution systems and interfaces with other functional areas.

4167 Operations Planning and Control (3) Prereq.: ISDS 3111 or equivalent. Planning and control of operations in manufacturing and service organizations; aggregate planning, master scheduling, requirements planning, and activity control; emphasis on developing skills through case studies and computer models.

4188 Supply Chain Management (3) Prereq.: ISDS 4165. Planning, implementing, and controlling the efficient, cost-effective flow and storage of raw material, in-process products, finished products, and related information in a supply channel; resource/material management; supplier strategy; inventory planning and control; just-in-time systems; customer service; logistical interfaces with other functional areas; emphasis on concepts, model development, and analysis.

4180 Business Analysis in Practice (3) Prereq.: Senior standing or permission of instructor. Contemporary problems encountered by the business analysis professional; emphasis on case analysis and use of business analysis skills and computer technology to solve business problems.

4200 Quality Management (3) Prereq.: ISDS 3115. Credit will not be given for both this course and IE 4453. Principles and practices of statistical quality control in industries. Control charts for variables and for attributes; process capability analysis; acceptance sampling for variables and for attributes; design of experiments; Taguchi methods; and ISO 9000 standards.

4501 Systems Modeling and Analysis I (3) Prereq.: ISDS 2001. Final project involves the application of discrete-event simulation to a real-world problem. Modeling and analysis of production and service systems using discrete-event computer simulation; discrete-event simulation mechanics; model structure, model building, modeling of complex systems; verification and validation; arrival processes; design of simulation experiments; statistical analysis of terminating and steady-state systems.

4502 Systems Modeling and Analysis II (3) Prereq.: ISDS 4501. Final project involves the application of simulation to solve an operations problem in business or government. Advanced application of computer simulation concepts to dynamic systems; alternative approaches to simulation modeling; discrete-event, hybrid discrete/continuous, system dynamics, simulators, and template approach; further development of modeling and analysis skills; advanced analysis concepts including variance-reduction, simulation meta-models and simulation optimization.

4511 Industrial Simulation (5) Prereq.: IE 4510, 2090, credit or registration in IE 4362, or equivalents. See IE 4511.

5010 Statistical Methods for Public Administration (3) Prereq.: college algebra. 2 hrs. lecture; 2 hrs. lab. Open only to students in the M.P.A. program. Also offered as PADM 5010.

7000 Statistical Theory (3) Prereq.: ISDS 4000 or equivalent; and consent of instructor. Continuation of ISDS 4000. Theoretical basis for topics in statistical inference including tests of hypotheses, experimental design, regression analysis, general linear models, nonparametric statistics; sequential tests of hypotheses; and complex sample designs.

7009 Simulation of Stochastic Processes (3) Prereq.: fundamental knowledge of computer programming, statistics, and operations research; and consent of instructor. Simulation models, methodologies, and languages; development of complex models; validation of results; completion of several large-scale projects involving extensive use of digital computer required.

7010 Decision Models for Public Administration (3) Open only to students in the M.P.A. program. See PADM 7010 and POLI 7010.

7016 Theory of Quadratic Programming (3) Prereq.: ISDS 4000 or equivalent. Joint, marginal, and conditional probability distributions treated in detail; stochastic processes, including random walks, Markov processes, birth-death processes, stationary stochastic processes, and renewal processes; statistical inference based on stochastic processes.

7021 Sample Design and Analysis (3) Prereq.: BADM 7020 or equivalent. Methodology of designing sampling systems; alternative sample designs; relative efficiency of sampling systems; problems if bias; techniques of estimation; criteria for selecting optimal sampling plans; emphasis on applications with theoretical foundations.

7022 Multivariate Data Analysis (3) Prereq.: BADM 7020 or equivalent. Multivariate methods, including principal components, canonical correlation, factor analysis, discriminate analysis, classification procedures.

7024 Advanced Statistical Analysis for Research I (3) Prereq.: proficiency in calculus, linear algebra, basic statistical methods, and computer programming. Methods of statistical inference; statistical estimation; testing hypotheses about single and multiple means and proportions; simple and multiple linear regression; design of simple random, stratified, and cluster samples; extensive use of statistical computer programs.

7025 Advanced Statistical Analysis for Research II (3) Prereq.: ISDS 7024 or equivalent. Continuation of ISDS 7024. Advanced regression analysis; experimental design and analysis of variance; nonparametric methods; multivariate techniques; extensive use of statistical computer programs.

7027 Advanced Forecasting Models (3) Prereq.: BADM 7020 or equivalent. Advanced topics in forecasting; time-series analysis; emphasis on stochastic parameter models and autocorrelated error structures; univariate autoregressive integrated moving average (ARIMA) models; multivariate models and transfer functions; extensive use of computer programs.

7070 Seminar in Advanced Business Problems (3) May be taken for a max. of 6 hrs. of credit when topics vary. Special topics in statistics and quantitative methods.

7101 Introduction to Operations Research Methods (1.5) Prereq.: BADM 7020 or equivalent. Topics cover models that support managerial decision-making including decision analysis, simulation, risk analysis, linear programming, and integer programming; Excel spreadsheet is used extensively.

7102 Survey of Operations Research: Deterministic Models (3) Prereq.: ISDS 7101. Integer and mixed-integer programming, extensions of classical optimization, quadratic programming, separable programming, and dynamic programming; applications of more advanced mathematical programming; techniques with some theory.

7103 Survey of Operations Research: Stochastic Models (3) Prereq.: ISDS 7101 or 4021. Extensions of decision theory, game theory, dynamic programming, Markov decision processes, probabilistic models, and queuing models; applications in various research areas.

7105 Digital Methods (3) Prereq.: ISDS 7102 and working knowledge of FORTRAN. Numerical problem solving in operations research and statistics; Monte Carlo methods, numerical solution of systems of equations, search techniques, and heuristics.

7106 Multiple Criteria Decision Making (3) Prereq.: ISDS 7103. Theory of the displaced ideal, linear multi-objective programming, goal programming, compromise programming, and multi-attribute utility measurement.

7107 Dynamic Programming (3) Prereq.: ISDS 7102. Theory and computational techniques of dynamic programming; single and multidimensional problems; relationship to classical optimization techniques.


7200 Quality and Productivity Management (3) Contemporary topics in total quality management; quality in software and system design and implementation; problem solving tools; process control; quality deployment and PFMIA; team building and quality standards and awards; control charts for variables and for attributes; process capability analysis; acceptance sampling plans; design of experiments; Taguchi methods; binomial and ISO 9000 standards.

7210 Process and Planning Control (3) Prereq.: BADM 7020 or equivalent. Topics of effectively managing projects including setting goals and objectives, project planning, evaluation and review; incentives and qualitative analysis, and project accounting; extensive use of cases involving hands-on computer analyses with state-of-the-art project management software.

7220 Supply Chain Management (3) Prereq.: ISDS 7102 or equivalent. Perspective for managers to integrate operations strategy into an overall business strategy; issues in selection of the capabilities, characteristics, and configuration of facilities; process/techologies; aggregate capacity; vertical integration; operations infrastructure; organizational structure and jobs; extensive use of case analyses drawn from service and manufacturing industries.

7225 Advanced Operations Management (3) Prereq.: BADM 7120. May be taken for a max. of 9 hrs. of credit when topics vary. Topics such as material requirements planning, inventory control, scheduling, facilities location and layout, quality control, job design, industrial design, network analysis; emphasis on application of techniques.
7510 Database Management (3) Prereq.: BADM 7050. Analysis, design, and implementation of databases based on the relational database model; data modeling using entity-relationship (E-R) diagramming; logical and physical database design; SQL; hardware/software architecture considerations; data and database administration; emerging database technologies and advanced database applications.

7511 Advanced Database Management (3) Prereq.: ISDS 7510 or equivalent. Decision support systems, online analytical processing, multidimensional data modeling, web-enabled data warehousing, data marts, data mining, knowledge management, Internet business intelligence.

7520 Network Information Systems (3) Prereq.: BADM 7050. Broad overview of network technologies including protocols, network operating systems, and network management; LAN, WAN design; Internet technology; network security.

7522 Internet Systems Development (3) Prereq.: ISDS 7520. In-depth look at Internet applications architecture, server-side programming, web-database connectivity, integration of Web and other business applications, and Web development methods; emphasis on self-management, cross-project coordination, technology and time management; construct Internet based systems and manage Internet based systems development.

7530 Information Systems Analysis and Design (3) Prereq.: BADM 7050; ISDS 7510. Both courses may be taken concurrently. Analysis and design of information systems from a management perspective; software development methodology; topics include requirements determination; feasibility determination; project management; evaluation of a software development strategy and application design; modeling using ER diagrams, and DFDs; systems implementation.

7535 Information Technology Management (3) Prereq.: BADM 7050. Management of the organization’s information technology (IT) resources; planning and management of IT strategy; applications; hardware/software infrastructure, information resources, and IT professionals; organization and governance of the IT function, IT policies and standards, measurement of IT investments and returns, and deployment of new information technologies.

7540 Electronic Commerce (3) Prereq.: BADM 7050. Use of information technology and the Internet in creating new forms of business organization; creating a marketplace; disintermediation/ reintermediation; and virtual organization.

7543 Electronic Commerce II (1.5) Prereq.: ISDS 7540. Continuation of ISDS 7540. Advanced management issues, organizing principles and technologies; working in electronic communities; newsgroups, virtual communities, extranet and intranet.

7545 Collaborative Computing (1.5) Prereq.: BADM 7050. Foundation of collaborative computing; issues of motivation, synchronicity, anonymity, group size, group proximity, and group tasks.

7550 Enterprise Systems (3) Prereq.: BADM 7050. Study of the broad area of Integrated Enterprise-wide Systems; emphasis on features and capabilities of enterprise systems and their related technologies, the methodologies used to implement these systems in organizations, and the implications of their deployment in organizations.

7553 Business and Systems Change (3) Prereq.: ISDS 7530. Foundation of critical issues in the design and implementation of business and information systems change including business process reengineering, project and change management, and information systems design and management; emphasis on the systems perspective of business, and the change that these enabling emerging and disruptive technologies and systems permit that have the greatest impact on business and industries.

7555 Auditing Enterprise Systems (1.5) Prereq.: ISDS 7550 and ACCT 7233. Principles of auditing enterprise-wide information systems in business; audit plans; controls and security issues.

7560 Social and Organizational Issues in MIS (3) Prereq.: BADM 7050. Impact of electronic communities on organizations; implications of design choices on business; ethical considerations.

7565 Global Information Technology Management (3) Prereq.: BADM 7050. National IT policies; IT and national culture; IT management in multinational companies; IT diffusion in developed versus developing countries; IT and national development; global electronic commerce; global telecommunications infrastructure; and competitive advantage through global IT management.


7910 Contemporary Issues in Production/Operations Management (3) Prereq.: advanced Ph.D. standing or consent of instructor. May be taken for a max. of 9 hrs. of credit when topics vary. Philosophical foundations and contemporary issues in production/operations management.

7920 Contemporary Issues in Management Information Systems (3) Prereq.: advanced Ph.D. standing or consent of instructor. May be taken for a max. of 9 hrs. of credit when topics vary. Philosophical foundations and contemporary issues in management information systems.

7950 Research Seminar in Information Systems Topics (3) Required for all Ph.D. students. May be taken for a max. of 6 sem. hrs. of credit when topics vary. Contemporary research and critical issues in information systems.

7990 Project (3-6) Prereq.: advanced master’s standing or consent of instructor. May be taken for a max. of 6 hrs. of credit. Pass-fail grading.

8000 Thesis Research (1-12 per sem.) “S”/“U” grading.

8900 Pre-dissertation Research (1-9) May be repeated for credit.

9000 Dissertation Research (1-12 per sem.) “S”/“U” grading.