

COURSES FOR INFORMATION SYSTEMS, STATISTICS AND MANAGEMENT SCIENCE

Management Information Systems Courses

MIS501 Application Development for the Data-Driven Organization Hours 3

This course will highlight one or more core programming languages (e.g., Java, Python) used within modern, data-driven organizations for the purpose of data collection, manipulation, and analysis. The first portion of the course will focus on essential programming knowledge and practices. The second portion of the course will emphasize the development of programmatic solutions, which will acquire data (e.g., web content, social media data, geospatial data, sensor-based data) through the integration of APIs and/or web services as well as ethical scraping techniques and then store the data in a modern backend database.

MIS502 Database Design and Management in the Data-Driven Organization Hours 3

This course will cover the essentials of database design and management in modern, data-driven organizations. The first portion of the course will focus on relational database design as well as SQL for the storage and access of structured data. The focus of the second portion of the course will highlight modern database structures/systems (e.g., Apache Hadoop, graph databases) as well as their query languages for storing, accessing, and analyzing more unstructured data or data having relationships not easily queried by traditional databases. Additional topics may include data cleansing, query optimization, and extract-transform-load (ETL) processes.

MIS505 Enterprise Networking and Security Hours 3

Data communications and networks; impact on business enterprises and issues pertaining to design and implementation. Security and operational requirements evaluated in multiple network architectural configurations.

MIS511 Management Information Systems Hours 1-3

Motivation for, construction of, and application of MIS. Topics include IS strategic alignment, information intensive business processes, and decision making. Business analysis techniques are emphasized for systems such as TPS, e-business, management reporting systems, and data warehouses.

MIS515 Intro to Application Development Hours 3

This bridge course intends to introduce students into the basics of application development using Python programming language. Students will gain a fundamental understanding of contemporary application development using Python as the programming language. Students will gain proficiency in creating functional Python scripts to build variety of applications in the area of system development. Python provides a simple and versatile development environment suitable for projects ranging from simple scripting applications to large-scale enterprise applications. In addition to core programming fundamentals, the course will also incorporate system development best practices such as team collaboration, version management, documentations, unit testing, styles and standards. In the process, students will explore the multitude of standard libraries available in the Python development ecosystem to accomplish various problem-solving tasks.

MIS520 Systems Analysis And Design Hours 3

Techniques and methodologies of systems analysis and design are introduced, including conducting project scoping, requirements elicitation, requirements definition, and operations specifications.

MIS521 Enterprise Application Development Hours 3

The study, application, and analysis of advanced software engineering, application patterns, and file structures. Students design, construct and test software structures for effective information management.

Prerequisite(s): Admission into the MSMIS program. MIS 321 Business Programming II and MIS 330 Database Administration

MIS525 Informatn Systems Project Mgt Hours 3

Techniques and methodologies of project level scoping, staffing, planning, scheduling, monitoring, and controlling the development of value-added information technology business solutions on time and within budget.

MIS527 Emerging Info Technologies Sem Hours 3

Course covers fundamental purchasing systems applications, supplier relations and evaluation, strategic planning in purchasing, purchasing techniques, value analysis and cost analysis.

MIS530 Sys Development/Implementation Hours 3

Techniques and methodologies of project-level systems development and delivery are introduced including interface design, platform constraints, application architecture, testing, quality control, security, and performance evaluation.

Prerequisite(s): MIS 520

MIS531 Health IT

Hours 3

The fragmented healthcare environment is going through a profound shift in its approach to delivering better healthcare services through the implementation of healthcare IT (HIT). This course provides an overview of the healthcare environment and the role of HIT in enabling service delivery capabilities. Specifically, this course is designed to provide students with the knowledge and skill to understand the role of HIT in creating and managing the cross-continuum systems of care. Furthermore, the course prepares students with the knowledge and skills essential to managing HIT and its assimilation in the complex domain of healthcare.

MIS535 Information Systems Consulting

Hours 3

Techniques and methodologies in client relationship management, proposal development, scope negotiation, component-based costing, knowledge management, software module and deliverable integration, systems deployment, and change management.

Prerequisite(s): MIS 520

MIS540 Dbase Design/Construction/Oper

Hours 3

Emphasizes commercial business application of relational DBMS. Topics include semantic data modeling, normalization, process triggers, enterprise integrated, ODBC, n-tier architecture, e-business application, and performance tuning.

MIS541 Business Analytic Support Sys

Hours 3

System level concepts, methods, tools and techniques for model-driven, data-intensive decision making. Topics include: structuring data, information and knowledge in data warehouses and data marts, and analytic procedures.

MIS560 Enterprise Integration Methods

Hours 3

Introduction to techniques and methodologies of enterprise-level governance, architecture, analysis, design, procurement, integration and deployment.

MIS561 Applied Cyber Security

Hours 3

This course examines management issues and practical implications related to securing information systems. This course focuses on the Threat Environment, security Policy and Planning, Cryptography, Secure Networks, Access Control, Firewalls, Host Hardening, Application Security, Data Protection, Incident Response, and Networking and Review of TCP/IP. A clear theoretical understanding supports a large practical component where students learn to use contemporary security software to secure and assess information systems and network infrastructure using a hands-on approach.

MIS563 Behavioral Cyber Security

Hours 3

This course provides students with a solid foundation of information security management, with an emphasis on its human element. As part of this understanding, we will explore how humans, as employees of an organization and consumers of organizational products and services, perceive threats to themselves, their digital assets, their privacy, and to their organizational affiliations. We also explore how these perceptions are operationalized in their behaviors as organizational insiders, serving to either undermine or facilitate security management practices.

MIS564 Organizational Security Management

Hours 3

The course is intended to teach students how to develop and apply an information security management plan to an organization. Topics include governance and security policy, threat and vulnerability management, incident management, risk management, information leakage, crisis management and business continuity, compliance management, and security awareness and security implementation considerations.

Students will also be exposed to the national and international policy and legal considerations related to cybersecurity and cyberspace such as privacy, intellectual property, and cybercrime.

MIS566 Introduction to Cybercrime and Digital Forensics

Hours 3

This course introduces the topics of cybercrime and digital forensics. Students will learn different aspects of cybercrime and methods to uncover, protect and analyze digital evidence. They will be exposed to different types of software and hardware tools and use them to perform rudimentary investigations. Cybercrime and digital forensics are increasingly important areas of study. Students will also gain an understanding of evidentiary law from the perspective of first responders. Tools are becoming more powerful and attacks more sophisticated. Consequently, there is a growing need for graduates with the skills to investigate these crimes.

MIS591 Independent Study Mgt Info Sys

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Hours 3

No description available

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Special Topics Course

MIS592 Internship In Mgt Info Systems

Hours 3

No description available

MIS597 Spec Top Mgt Info Systems

SP

Hours 1-6

No description available

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Special Topics Course

MIS598 Res In Management Info Systems

Hours 1-6

Open to students nearing completion of coursework for the master's degree. A supervised study and investigation of specific problems in management and management information systems.

MIS670 MIS Behavioral and Organizational Theory and Design Research Seminar

Hours 3

The exploration of IS development and delivery research issues. Emphasis is placed on exploring the scientific method, theory building research, and methods of inquiry. Provides a framework for undertaking and evaluating MIS research.

MIS680 Research Seminar II

Hours 3

This doctoral research seminar will provide students with a strong foundation in the theoretical and methodological knowledge required to conduct rigorous security and privacy research projects that lead to manuscripts suitable for publication in leading journals. This knowledge is what we term "procedural knowledge" and, just as you cannot learn how to ride a bike by reading about it, students must engage in actual research activities to learn the requisite knowledge. In this course, students will first critically review security and privacy research publications from the leading MIS journals and then, based on those studies, conceive a full research project, including a relevant set of research questions and a research design appropriate to the questions.

Prerequisite(s): MIS 670 or Instructor Approval

MIS685 MIS Research Design Seminar

Hours 3

This course is an examination of the process of designing and conducting research projects on information systems phenomena. Students will gain an appreciation for the challenges and issues associated with the application of different research methodologies to MIS phenomena.

MIS690 Research Methods Seminar

Hours 3

This seminar is a discussion of the basis and principles of systems modeling and the methods of social science research. The seminar also nurtures the motivation to become a contributor to the organizational sciences and information systems research communities by examining research processes, methodologies, and strategies, the information systems research context, concepts, theories, the application of systems modeling, and the nature of MIS research.

MIS699 Dissertation Research

Hours 1-12

This independent research course partially fulfills required doctoral-level research dissertation hours toward the doctoral degree. Under the guidance of their dissertation advisor, students conduct research toward the completion of their doctoral dissertation. Employing various research techniques and methodologies, students work on theoretical and/or applied research topics with the aim of making a novel contribution to the field.

Operations Management Courses**OM500 MGT Science & Spreadsheet Mod**

Hours 3

This course provides Operations Management concepts and applications in data-driven decision making. Emphasis is on data clean-up, data analysis, problem formulation, and interpretation of results using spreadsheet-based modeling and solution procedures including optimization and simulation approaches.

Prerequisite(s) with concurrency: ST 509 or ST 560

OM501 Advanced Applied Modeling and Analysis

Hours 3

Building on the foundations of spreadsheet modeling analysis, this course provides a deeper understanding of optimization and simulation. Course topics include discrete optimization, duality and sensitivity, large scale optimization, multi-objective optimization, dynamic programming, and Monte Carlo and process simulations with an emphasis on practical applications. In addition to spreadsheets, the students will learn specialty optimization and simulation software, including heuristic methods and algorithms. Extensive use of software.

Prerequisite(s): OM 500

OM506 Business Spreadsheet Analytics

Hours 1-3

This course provides Operations Management concepts and applications in data-driven decision making. Emphasis is on data clean-up, data analysis, problem formulation, and interpretation of results using spreadsheet-based modeling and solution procedures including optimization and simulation approaches.

Prerequisite(s) with concurrency: ST 509 or ST 560

OM516 Operations Management

Hours 3

This course will address the important concepts and issues related to the design and management of business operations including manufacturing, distribution, logistics, transportation, and service operations. The course will demonstrate how certain quantitative methods can be applied to the analysis and solution of problems that arise in operations management.

OM517 Supply Chain Modeling & Analy

Hours 3

This course provides a framework and quantitative methods for designing, managing, and analyzing the supply chain operations needed to support a firm's business strategy. Students will study the structure of supply chain operations in terms of six supply chain drivers (facilities, inventory, transportation, information, sourcing, and pricing). Students will develop analytical models and analyze the relationship between supply chain structure and performance through case studies and examples.

Prerequisite(s) with concurrency: OM 500 or OM 506

OM522 Operations Scheduling Problems

Hours 3

A broad investigation of a variety of scheduling activities in production, logistics or service environment are discussed. Typical topics include project scheduling, job-shop scheduling, routing related problems and manpower scheduling.

Prerequisite(s): OM 500 or OM 506

OM523 Inventory Management

Hours 3

Principles, models, and techniques for planning, analyzing, and controlling inventory systems are discussed. Topics include in depth analysis of deterministic and stochastic inventory models and their applications. The limitations and usefulness of these models in practice are addressed.

Prerequisite(s): ST 509 or ST 550 or ST 560

OM524 Mfg Sched & Control Systems

Hours 3

An in-depth, analytical study of the systems used in manufacturing planning and control are covered. Alternative approaches used in practice (such as MRP and JIT) are studied.

Prerequisite(s): OM 500 or OM 506; and ST 509 or ST 550 or ST 560

OM525 Effective Quality Management

Hours 3

Provide participants with a broad understanding of philosophies and methods used to enhance organizational effectiveness in a wide range of organizational settings.

OM527 Purchasing and Sourcing

Hours 3

Course covers fundamental purchasing concepts and quantitative techniques for analyzing procurement practices, selecting suppliers, managing supply risk, and improving operational procurement decisions.

Prerequisite(s): OM 500 or OM 506

OM540 Systems Simulation

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Hours 3

A study of the management applications of stochastic and deterministic mathematical and computer models in systems design and analysis. Computing proficiency is required for a passing grade in this course.

Prerequisite(s): ST 509 or ST 550 or ST 560

Computer Science

OM592 Internship

Hours 3

No description available

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OM596 Capstone Project

Hours 3

This course requires the student to apply his/her knowledge of the field of Operations Management to recognize and model operational problems and/or processes targeted for improvement. Further, the student must provide evidence of his/her abilities to communicate understanding of the problem or process, describe the analysis performed, and organize this material effectively for both a written report and corresponding oral presentation.

OM597 Special Topics in OM

SP

Hours 1-6

No description available

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Special Topics Course

OM598 Research

Hours 1-6

Open to students nearing completion of coursework for the master's degree. A supervised study and investigation of specific problems in management and operations management.

OM600 Linear Program: Theory & Appli

Hours 3

The theory and application of linear programming are rigorously studied. Software tools such as AMPL and OPL Studio for solving linear programs are introduced.

OM601 Stochastic Decision Models

Hours 3

Probabilistic models in the decision-making process are discussed. Attention is given to the assumptions, development, and administrative implications of dynamic programming, queuing analysis, and decision analysis.

Prerequisite(s): MATH 557

OM602 Nonlinear Modeling and Optimization

Hours 3

Theoretical and applied aspects of nonlinear modeling and optimization such as unconstrained and constrained optimization, duality, barrier and interior point methods, and large-scale optimization.

Prerequisite(s): OM 600

OM603 Integer Modeling and Optimization

Hours 3

Theoretical and applied aspects of integer and discrete modeling and optimization such as valid inequalities, transformations, branch and bound, column generation, and branch and cut.

Prerequisite(s): OM 600

OM620 Production Management Models

Hours 3

A quantitative study of models and procedures used in various decision problems addressed by production and operations managers is completed in this course. Mathematical modeling and optimization software packages are used in solving these models.

Prerequisite(s): OM 500

OM695 Operations Management Seminar

Hours 1

A learning environment designed to expose Ph.D. students to a wide array of issues and topics related to operations management research.

OM697 Special Topics

SP

Hours 1-6

Special Topics.

Special Topics Course

OM699 Dissertation Research

Hours 1-12

No description available

Statistics Courses

ST509 Stat For Business Appl

Hours 3

A broad introduction to statistical and probabilistic methods useful for managerial decision making. Topics include graphical displays, numerical summaries, basic probability models, confidence intervals, hypothesis testing, and regression analysis.

ST521 Statistical Data Management

Hours 3

Introduction to the management of data using SAS. The collection and management of data from business or scientific research projects are emphasized.

ST522 Adv Statistical Data Mgt

Hours 3

This course provides students with insight and understanding into the advanced aspects of data management. Emphasis will be placed on computer techniques for the preparing and cleaning of data from scientific research projects as well as for business-oriented projects in order to conduct advanced level analyses. Techniques for detecting, quantifying, and correcting data quality will be covered.

Prerequisite(s): ST 521

ST531 Data Mining I

Hours 3

Data mining is the process of selecting, exploring, and modeling large amounts of data to uncover previously unknown patterns of data. Techniques for accomplishing these tasks in a business setting will be discussed.

Prerequisite(s): ST 550 or ST 560 or ST 509

ST532 Advanced Data Mining

Hours 3

A detailed study of data mining techniques including logistic regression, neural networks, decision trees, general classifier theory, and unsupervised learning methods. Mathematical details and computer techniques are examined. The SAS programming language and SAS's Enterprise Miner will be used to accomplish these tasks. Other packages may also be used.

Prerequisite(s): ST 531

ST540 Statistical Programming and Computing with R

Hours 3

This course explores the syntax of the R language and its capabilities for statistical data analysis, computing, and graphics.

Prerequisite(s): ST 260

ST541 Applied Statistical Modeling for Analytics I

Hours 3

Emphasis is on practical methods of statistical data analysis and their interpretation. Topics include simple and multiple linear regression, regression model interpretation, regression diagnostics, transformations on dependent and independent variables, qualitative independent variables, regression inference, strategies for model building, methods for forecasting time series data. Extensive use of statistical software.

Prerequisite(s): ST 560

ST542 Applied Statistical Modeling for Analytics II

Hours 3

Emphasis is on practical methods of statistical data analysis and their interpretation. Topics include design and analysis of experiments (completely randomized design, randomized block design, factorial designs, 2^{k-p} fractional factorial designs, response surface optimization), multivariate inference, dimension reduction, classification, and clustering. Extensive use of statistical software.

Prerequisite(s): ST 541- Applied Statistical Modeling for Analytics 1 (or equivalent)

ST545 Introduction to Statistical Learning and Data Mining

Hours 3

This course offers an introduction to the field of statistical learning, an essential toolkit for making sense of vast and complex data sets.

Prerequisite(s): ST 452 or ST 552 or ST 560

ST547 Data Visualization and Analytics in R

Hours 3

Data visualization is one of powerful tools to explore and understand data. This course is intended to introduce students to useful visualization techniques for data exploration and presentation using the free and open-source R computer programming. Basic syntax and capabilities of the R language are also covered.

Prerequisite(s): ST 550 or ST 560 or ST 509

ST550 Stat Methods In Res I

Hours 3

Development of fundamental concepts of organizing, exploring, and summarizing data; probability; common probability distributions; sampling and sampling distributions; estimation and hypothesis testing for means, proportions, and variances using parametric and nonparametric procedures; power analysis; goodness of fit; contingency tables. Statistical software packages are used extensively to facilitate valid analysis and interpretation of results. Emphasis is on methods and on selecting proper statistical techniques for analyzing real situations.

ST552 Applied Regression Analy

Hours 3

Modeling issues for multiple linear regression are discussed in the context of data analysis. These include the use of residual plots, transformations, hypothesis tests, outlier diagnostics, analysis of covariance, variable selection techniques, weighted least squares and colinearity. The uses of multiple logistic regression are similarly discussed for dealing with binary-valued dependent variables.

Prerequisite(s): ST 450 or ST 550 or ST 560 or ST 509

ST553 Appld Multivariate Analy

Hours 3

Methods and business applications of multivariate analysis, discriminant analysis, canonical correlation, factor analysis, cluster analysis, and principal components.

Prerequisite(s): ST 554

ST554 Math Statistics I

Hours 3

The course introduces probability theory. It covers fundamental concepts and theorems, such as probability distribution; random variable; mathematical expectation, variance, moments, independence, and transformations of random variables; multivariate distributions, sampling distributions, central limit theorem and law of large numbers.

Prerequisite(s): MATH 227

ST555 Math Statistics II

Hours 3

Theory of order statistics, point estimation, interval estimation, and hypothesis testing.

Prerequisite(s): ST 554

ST560 Statistical Methods

Hours 3

Statistical methods for summarizing data; probability; common probability distributions; sampling and sampling distributions; estimation and hypothesis testing for means, proportions, and variances using parametric and nonparametric procedures; power analysis; goodness of fit; contingency tables; and simple regression and one-way analysis of variance.

ST561 Applied Design Expermnts

Hours 3

An introduction to the design and analysis of experiments. Topics include factorial, fractional factorial, block, incomplete block, and nested designs. Other methods discussed include Taguchi Methods, response surface methods, and analysis of covariance.

Prerequisite(s): GES 400 or GES 500 or BER 540 or POPH 422 or POPH 522 or ST 509 or ST 550 or ST 560

ST580 Analytics Capstone I

Hours 3

The study and application of advanced analytics applications. Students design, construct, test, and present applications to solve real-world analytics problems.

Prerequisite(s): Admission into the Masters of Science in Business Analytics (MSBA) program. MIS 501 and MIS 502

ST581 Analytics Capstone II

Hours 3

The study and application of advanced analytics application. Students design, construct, test, and present applications to solve real-world analytics problems.

Prerequisite(s): ST 580

ST591 Independent Study

SP

Hours 3

No description available

Special Topics Course

ST592 Internship

Hours 3

*No description available***ST597 Special Topics**

SP

Hours 1-6

No description available

Special Topics Course

ST603 Advanced Inference

Hours 3

A continuation of ST 555, with emphasis on the general theory of estimation and hypothesis testing and large sample distribution theory.

Prerequisite(s): ST 555

ST610 Linear Models

Hours 3

Gauss-Markov Theorem, solution of linear systems of less than full rank, generalized inverse of matrices, distributions of quadratic forms, and theory for estimation and inference for the general linear model.

Prerequisite(s): ST 555

ST615 Theory Of Regression

Hours 3

Theory of the general linear regression models and inference procedures, variable selection procedures, and alternate estimation methods including principal components regression, robust regression methods, ridge regression, and nonlinear regression.

Prerequisite(s): ST 610

ST635 Nonparametric Statistics

Hours 3

Theory and applications of various nonparametric statistical methods are covered for one-sample, two-sample, and multi-sample problems. Goodness of fit techniques such as Chi-square and the kolmogorov-Smirnov test are covered along with graphical analysis based on P-P and Q-Q plots. Computer software such as MINITAB, SAS, and STATXACT are used.

Prerequisite(s): ST 555 and ST 560

ST640 Statistical Computing

Hours 3

Topics include a survey of current statistical software, numerical methods for statistical computations, nonlinear optimization, statistical simulation, and recent advances in computer-intensive statistical methods.

Prerequisite(s): ST 540 and ST 555

ST645 Advanced Statistical Learning

Hours 3

This course offers theory, methodology and applications of modern statistical learning tools.

Prerequisite(s): ST 552, ST 553, and ST 554 Matrix algebra, Multivariate calculus, Statistical methods, Applied Multivariate Methods or permission of instructor.

ST697 Special Topics

SP

Hours 1-6

Special topics in statistics.

Special Topics Course

ST698 Research In Statistics

Hours 1-6

Open only to graduate students nearing completion of coursework. Independent study and investigation of specific problems for advanced students of statistics.

ST699 Dissertation Research

Hours 1-12

No description available