

# MANAGEMENT INFORMATION SYSTEMS (MIS)

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Courses primarily for undergraduates:

## MIS 2070: Fundamentals of Programming for Business and Analytics

Credits: 0-99. Contact Hours: Lecture 3.

*Prereq:* MATH 1500 or credit or enrollment in MATH 1400 or higher

Introduction to programming (what it is and how it works) and problem-solving methods, emphasizing the basics of good programming techniques and style. Covers data types, control and data structures, functions, parameter passing, library functions, and object-oriented design to develop business and analytics applications. (Typically Offered: Fall, Spring)

## MIS 3010: Management Information Systems

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* COMS 1130

The role of information technology in organizations. Overview of methodologies for design and development of systems including decision support systems, expert systems, data bases, end-user computing, etc. Computer applications relate concepts to practice. Lecture and laboratory work emphasizes the enabling role of IT in contemporary organizations. (Typically Offered: Fall, Spring, Summer)

## MIS 3070: Intermediate Business Programming

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 2070 and credit or enrollment in MIS 3010

Introduction to the concepts and use of data structures, file accesses and object oriented programming methodologies in contemporary business environments. Application development environments will be covered.

## MIS 3100: Information Systems Analysis

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* Credit or enrollment in MIS 3010

Critical analysis of business processes, data and process modeling, feasibility studies, CASE tools, and developing system design specifications.

## MIS 3150: Business Data Streams and Issues

(Cross-listed with ACCT 3150).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* ACCT 2840 and MIS 3010

Identification of open data sources and other private data sources. Develop methods of data access, collection, and sharing; develop methods to validate and standardize data sources; develop methods to assess data worthiness (risk). Typically Offered: Fall (even-numbered years), Spring (odd-numbered years), Summer (annually).

## MIS 3200: Database Management Systems

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* Credit or enrollment in MIS 3010

Database design, development, and implementation. Focus on data models, both classical and object oriented. Uses relational and/or object oriented database management systems.

## MIS 3400: Project Management

(Cross-listed with SCM 3400).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* Credit or enrollment in MIS 3010

Equips students to support team activities in the general project management environment and better manage their careers. Practical experience using project management techniques and tools. Course topics include project initiation and execution, risk assessment, estimating and contracts, planning, human factors, and standard methods.

## MIS 3670: Consultative Problem Solving

(Cross-listed with MKT 3670).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* Sophomore classification

Consultative problem-solving approach to address complex problems in marketing and related fields. Topics include problem definition, issue tree dis-aggregation, hypotheses development and the Pyramid Principle. Development of skills such as formulating problems, structuring and prioritizing problems, synthesizing results and communicating intuition from quantitative analyses. (Typically Offered: Fall, Spring)

## MIS 3680: Marketing Analytics

(Cross-listed with MKT 3680).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MKT 3400 and STAT 2260 or equivalent

Use of different tools to conduct various analyses to support marketing strategies. Topics include data visualization and exploration, forecasting, social media analytics and other marketing techniques. Development of skills such as structuring problems, and synthesizing results from quantitative analyses. (Typically Offered: Fall, Spring)

**MIS 4030: Healthcare Information Systems**

(Cross-listed with HCM 4030).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 3010 and credit or enrollment in HCM 3010

Explores the critical role information technologies and systems play in healthcare organizations. The focus is on evaluating and implementing software and IT systems that facilitate delivery of health care; understanding information technology governance, data privacy, and security; planning and project management; and tracking future developments of information technology in healthcare management. Introduction to Electronic Health Records (EHR) and other Management and Financial Information System applications used by healthcare organizations.

**MIS 4070: Advanced Business Programming**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 3070.

Advanced software development and topics in contemporary programming languages. Topics include basic syntax, advanced programming techniques, file structures and management, database access, algorithm design, web forms and graphical user interfaces.

**MIS 4100X: Blockchain and Cryptocurrency**

(Dual-listed with MIS 5100X).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 2070 or COMS 2070 or COMS 2270

The design and application aspects of blockchain technologies, cryptocurrencies, and the key value these technologies bring - distributed consensus and trust disintermediation. Study of how blockchain technology works with consideration to its potential disruptive impact on business and society. Key concepts include mining, hashing, proof-of-work, proof-of-stake, public key cryptography, smart contracts, and the double-spend problem. (Typically Offered: Spring)

**MIS 4350: Cybersecurity in Business**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 3010

Introduction to fundamental concepts in networking and cloud computing and related cybersecurity concepts. Examination of network and cloud architectures, technologies, management and governance, security controls and techniques used to design, deploy, and protect resources in those environments. Exposure to cybersecurity tools in hands-on labs and explore methods of implementing and maintaining effective networks and cybersecurity programs in private, public, and cloud infrastructures.

**MIS 4360: Introduction to Business Analytics**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* (MIS 3200 or ACCT 3840) and credit or enrollment in STAT 3260 or STAT 3410

Introduction to the field of business analytics (BA). Students will examine BA processes and techniques used in transforming data to knowledge and creating value for organizations. Business cases, presentations by business professionals, class lectures and discussions on data analysis, design and modeling, and extensive hands-on analytical exercises.

**MIS 4390: Topics in Management of Information Systems**

Credits: 3. Contact Hours: Lecture 3.

Repeatable.

*Prereq:* MIS 3010

A variety of topics will be covered and topics may vary between semesters. Some of the topics are information resources management, electronic commerce, decision support systems, and expert systems.

**MIS 4400: Supply Chain Information Systems**

(Cross-listed with SCM 4400).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 3010, SCM 3010

Internal and inter-organizational information systems necessary for a supply chain to achieve competitive advantage. Topics include: design, development, implementation, and maintenance of supply chain information systems; enterprise resource planning; advanced planning and scheduling, manufacturing execution systems; and the interface between manufacturing planning and control processes, logistics processes, and the information system.

**MIS 4410X: Cybersecurity Analytics**

Credits: 3. Contact Hours: Lecture 3.

Repeatable.

*Prereq:* MIS 4350 and MIS 4360

Introduction to information security concepts, specifically how adversaries exploit systems and data for their benefit and how organizations can use analytics to detect and respond to security incidents. Survey of existing and emerging machine learning and artificial intelligence security tools for detecting and responding to security incidents. (Typically Offered: Spring)

**MIS 4450: Enterprise Cybersecurity**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 3010

Introduction to the elements of a cybersecurity program in the administrative, technical, and physical security domains. Learn methods to analyze and assess organizational risk and determine appropriate controls, be exposed to offensive and defensive cybersecurity tools in hands-on labs, and explore methods of implementing and maintaining effective cybersecurity programs. Examination of policy, frameworks, laws, regulations, and compliance and how they influence and contribute to cybersecurity programs.

**MIS 4460: Advanced Business Analytics**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* (MIS 3200 or ACCT 3840) and credit or enrollment in STAT 3260 or STAT 3410

Projects-based course which provides an in-depth understanding of BA methods of visualization, data mining, text mining, web-mining, and predictions through the use of specific BA tools. For students who are interested in understanding advanced techniques and applications of data analytics and acquiring hands-on skills for making intelligent business decisions in data-rich organizations.

**MIS 4470: Information Systems Development**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* MIS 3010 and MIS 3100

Design of business systems using contemporary tools and methods such as SQL, CASE tools, OOD tools, etc. Focuses on synthesizing concepts from earlier MIS courses.

**MIS 4500: Enterprise Resource Planning Systems in Supply Chain**

(Cross-listed with SCM 4500).

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* (MIS 3010 and SCM 3010) or (IE 1480 and IE 3410)

Enterprise Resource Planning Systems in Supply Chain.

**MIS 4900: Independent Study**

Credits: 1-3. Repeatable.

*Prereq:* Instructor Permission for Course

(Typically Offered: Fall, Spring, Summer)

**MIS 4950: Executive Presentation and Analysis**

Credits: 3. Contact Hours: Lecture 3.

Repeatable.

*Prereq:* MIS 3010

Students explore different practical scenarios related information systems projects and cases. Students acquire necessary skills and knowledge to solve practical issues associated with presented cases and problems. Students compete at different venues around the country. Graduation Restriction: Only 3 credits of MIS 4950 may count as a MIS major or minor choice elective. (Typically Offered: Fall)

**Courses primarily for graduate students, open to qualified undergraduates:**

**MIS 5010: Management Information Systems**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* Enrollment in MBA program or departmental permission.

Current theories and practices appropriate for understanding the role and application of information systems for individuals, organizations, and society within a globally competitive context. Focus on information technology and its uses in improving work practices, products, and tools for individuals and organizations. Issues pertaining to current and emerging topics in the development and use of technology, the role of technology in and its alignment with organizational strategy and sustainable business practices, information system planning and the development of enterprise architectures, and human interface and personal characteristics in the design and use of technology. (Typically Offered: Fall, Spring)

**MIS 5100X: Blockchain and Cryptocurrency**

(Dual-listed with MIS 4100X).

Credits: 3. Contact Hours: Lecture 3.

The design and application aspects of blockchain technologies, cryptocurrencies, and the key value these technologies bring - distributed consensus and trust disintermediation. Study of how blockchain technology works with consideration to its potential disruptive impact on business and society. Key concepts include mining, hashing, proof-of-work, proof-of-stake, public key cryptography, smart contracts, and the double-spend problem. (Typically Offered: Fall)

**MIS 5150: Big Data for Business**

Credits: 3. Contact Hours: Lecture 3.

*Prereq:* Graduate classification or Permission of Instructor

Understanding the issues and challenges of data from multiple sources, different velocities, in large volumes with questionable veracity. (Typically Offered: Fall)

**MIS 5200X: Healthcare Analytics**

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

A project-based course that provides an in-depth understanding of Healthcare Analytics methods of visualization, data mining, and predictions through the use of specific analytics tools. For students interested in understanding advanced techniques and applications of healthcare analytics and acquiring hands-on skills to apply to medicine and healthcare. (Typically Offered: Spring)

**MIS 5210X: Health Care Data Privacy, Security & Compliance**

Credits: 3. Contact Hours: Lecture 3.

Focus on healthcare data, the intricacies of security and privacy in the healthcare industry, and problems with compliance and reporting. Exposure to many sorts of data sources and data components used in healthcare as a health IT professional. Emphasis on fundamental terms used in healthcare data as well as the delicate nature of protected health information. Detailed coverage of HIPAA and the dangers of security lapses, malware, and phishing. In depth attention of some of the most significant laws and rules that are unique to the healthcare industry and the significance of compliance. (Typically Offered: Fall)

**MIS 5320: Programming Foundations for Business Analytics**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Explores the application of structured programming techniques for business analytics. Topics include data collection, processing, analysis, and more. Focus is on individual and group activities that reinforce skills development and provide the basis for later advanced work in data modeling. (Typically Offered: Summer)

**MIS 5330: Data Management for Decision Makers**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Addresses data needs of functions such as marketing, finance, and production. Advanced skills needed to design, develop and use database, data warehousing and data mining systems for effective decision support. Emphasis on importance of contemporary technologies.

**MIS 5350: Networks and Information Security Management**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Issues involved in the management of telecommunications function. Overview of communications technology used in various business applications, local area network, wide area network, broad band network, wireless and voice networks. Internet technologies and protocols. Analyzing the strategic impact of these technologies on organizations. Strategic planning for telecommunications, including network planning and analysis.

**MIS 5360: Business Analytics Foundation**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Introduction to Business Analytics (BA) concepts and tools. Hands-on lab exercises and business case studies in data preparation, data querying and data visualization. Also covers various modeling techniques in predictive and prescriptive analytics.

**MIS 5370: Project Management**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Prepares students to support team activities in the general project management environment and provides them with a working understanding of the full scope of project management activities. Students will also have practical experience using project management techniques and tools. Course topics include project initiation and execution, risk assessment, estimating and contracts, planning, human factors, and standard methods. The course follows the recommended content areas of the Project Management Institute, and provides students with a recognized foundational training in project management.

**MIS 5380: Business Process Systems**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: MIS 5010; Graduate classification or Permission of Instructor*

Examine current and historical perspectives on business process management. Topics include process identification, mapping, and improvement. Additional topics will address business process automation and integration, business process outsourcing. Investigate current and potential tools and methods for business process management. Include process management projects.

**MIS 5390: Topics in Management of Information Systems**

Credits: 3. Contact Hours: Lecture 3.

Repeatable, maximum of 6 credits.

*Prereq: Graduate classification or Permission of Instructor*

A variety of topics may be offered in different semesters. Topics may include electronic commerce, information resources management, decision support systems, and expert systems.

**MIS 5410: Analytics in Finance**

(Cross-listed with FIN 5410).

Credits: 3. Contact Hours: Lecture 3.

*Prereq: BUSAD 5020*

Introduction to Business Analytics (BA) in finance and the insurance industry. The concepts and tools discussed in this course, to be followed and complemented by more advanced courses in the area. Basic analytical thinking and business acumen focusing on applications from finance and insurance. Practical data analytic skills based on building real analytic applications on real data. (Typically Offered: Spring)

**MIS 5440: Social Media Business Applications and Analytics**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: MIS 5360*

The role of new collaborative social technologies and analysis of social media data. Exploration of strategic and operational applications of social media and of tools that support the analysis of social network and social media data. Application of text analysis and social network theory. (Typically Offered: Summer)

**MIS 5450: Enterprise Cybersecurity Management**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Challenges, technologies, and practices of information security management in enterprise operations. (Typically Offered: Spring)

**MIS 5460: Advanced Business Analytics**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: MIS 5360*

An in-depth discussion of various advanced topics in Business Analytics (BA) such as Big Data Analytics, Text Analytics, and Web Analytics. Extensive hands-on exercises of using BA tools to solve real-world problems. Preparation for students' capstone projects. (Typically Offered: Fall, Spring)

**MIS 5470: Teams, Projects, and Analytics Leadership**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Provides business analytics students with an intensive preparation in teamwork and project management skills necessary to prosper in the program and carry forward into their professional lives. Topics include project management, team management, in class exercises, and case studies. Practical experience using project management techniques and tools. (Typically Offered: Summer)

**MIS 5480: Applications of Machine Learning for Business Intelligence**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Introduction to applications for data science concepts in the business domain. As big data, machine learning, business analytics, business intelligence and other concepts grow in business applications, it is essential for students to understand the underlying concepts, data, models, and applications to be successful in a data-driven world. Learn to determine problem types, data restrictions, model selection, tool choice, and analysis of data science concepts for greater business value. (Typically Offered: Fall)

**MIS 5510: IT Strategy & Execution**

Credits: 3. Contact Hours: Lecture 2, Discussion 1.

*Prereq: Graduate classification or Permission of Instructor*

Explore the building blocks of IT strategy in alignment with the business strategy. Emphasis on business aspects. Evaluate the impact of technologies on IT strategy. Explore IT strategy framework, understand the latest trends and exercise critical thinking with relevant case studies and discussion. Small groups will analyze a fictitious company as assigned and develop a future state IT vision and IT strategy that supports the business goals. Guest lecturers. (Typically Offered: Fall)

**MIS 5560: Business Analytics Capstone Project**

Credits: 3.

*Prereq: MIS 5470*

Synthesize analytics concepts, skills, and practices learned during the program of study to complete a course project. Projects proposals relevant to a firm are proposed and accepted midway through the program. Student cohort teams will complete the capstone project under the supervision of an advisory team of faculty. At the completion of the course teams will present their project marking the completion of the program of study. Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

**MIS 5680: Marketing Analytics**

(Cross-listed with MKT 5680).

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification or Permission of Instructor*

Integration of various concepts to solve problems using appropriate tools. Specifically, the course consist of the following three components: (a) help students develop consultative problem-solving skills; (b) introduce various newly developed consumer behavior theories; (c) provide an overview of quantitative models in the field of marketing analytics. Hands-on experiences to enhance skills such as formulating problems, structuring and prioritizing problems, synthesizing results and communicating intuition from complicated analyses. (Typically Offered: Fall, Spring)

**MIS 5900: Special Topics**

Credits: 1-3. Repeatable, maximum of 3 credits.

*Prereq: Instructor Permission for Course*

For students wishing to do individual research in a particular area of MIS. (Typically Offered: Fall, Spring, Summer)

**MIS 5980: Research Seminar in Management Information Systems**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Graduate classification*

Examines issues such as the nature and content of information systems research; aspects of starting and pursuing research topics in information systems; exploring and understanding relevant research methods and tools. Develop preliminary research proposals.

**MIS 5990: Creative Component**

Credits: 3. Repeatable.

*Prereq: Instructor Permission for Course*

Preparation and writing of creative component.

**Courses for graduate students:**

**MIS 6010: Introduction to Information Systems Research I**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Enrollment in MIS PhD Program*

The state of behavioral research in the IS function. MIS activities in an organization span the following three major areas: design and implementation of the MIS, use of the MIS, and management of the MIS function. Each of these processes is carried out at several levels: individual, group, organizational and inter-organizational. Identify behavioral issues of relevance for the cells defined by the process and level dimensions. Reading and discussion of the research literature surrounding the development, use, and implications of information technology.

**MIS 6020: Introduction to Information Systems Research II**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Enrollment in MIS PhD Program*

Three fundamental areas of Information Systems, namely, infrastructure, management, and processes. Infrastructure studies examine the IT architecture including computing, communication, data, and application. Management focuses on addressing the value added notion of IT. Finally processing addresses topics related to enabling role of IT in myriad of areas.

**MIS 6030: Seminar on IT Strategy and Structure**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: MIS 6010*

Strategic issues in IT management. Address issues such as aligning IT strategy with corporate strategy and functional strategies, IT structure, valuation, governance and control, and related topics. Provide students with research skills related to the boundary between IT and the firm's external environment.

**MIS 6040: Collaboration, Knowledge, and Intelligence in Organizations**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: MIS 6010*

Research issues in the emerging areas of collaboration, knowledge management, and enterprise intelligence. Topics will include emerging and contemporary technologies of Data Mining, Knowledge Discovery from Databases, Web Mining, organizational memory, and knowledge management.

**MIS 6050: Technical Research Methods in Information Systems**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Enrollment in MIS PhD Program*

Focuses on analytical modeling and empirical analyses using methods drawn from economics, management science, and statistics/econometrics, etc. Example topics include economics of information goods; impact of information technologies on firm performance and policy outcomes; and analysis of data generated from social media and business transactions. (Typically Offered: Spring)

**MIS 6060: Economic Research Methods in Information Systems**

Credits: 3. Contact Hours: Lecture 3.

*Prereq: Enrollment in MIS PhD Program*

Focuses on analytical modeling and empirical analyses using methods drawn from economics, management science, and statistics/econometrics, etc. Example topics include economics of information goods; impact of information technologies on firm performance and policy outcomes; and analysis of data generated from social media and business transactions. (Typically Offered: Spring)

**MIS 6200: Overview of MIS Research**

Credits: 3. Contact Hours: Lecture 3.

Introduce doctoral students to the most cited research in IS, as well as to various behavioral research methods. Readings on research topics will cover categories of IS knowledge including: IS development, IT & individuals, IT & groups, IT & organizations, and IT & markets. Offered odd-numbered years. (Typically Offered: Fall)

**MIS 6250: Analytical Research in Information Systems**

Credits: 3. Contact Hours: Lecture 3.

Mathematical models to capture the essence or abstractions of real-world problems and applying established techniques to derive optimal solutions or business insights. Application of theories and tools from operations research, economics, computer science, and statistics to tackle problems regarding the development, marketing, utilization, and management of information technologies and systems in organizations and the society. Offered odd-numbered years. (Typically Offered: Spring)

**MIS 6300: Empirical Research in MIS**

Credits: 3. Contact Hours: Lecture 3.

Repeatable, maximum of 2 times.

Intermediate level statistical and econometric methods used in MIS research. Preparation to conduct rigorous longitudinal analyses. Statistical and econometric methods used to examine phenomena that can evolve with the passage of time. Methods used for analyzing cross-sectional data. Application of advanced empirical methods in combination with rigorous theoretical arguments. (Typically Offered: Fall)

**MIS 6350: Computational Research in MIS**

Credits: 3. Contact Hours: Lecture 3.

Introduction for doctoral students to Information Systems research methods rooted in computational thinking. Topics include important issues in IS research that benefit from computational thinking; and computational methodologies commonly used in IS research.

**MIS 6500: Research Practicum I**

Credits: 1.

*Prereq: Instructor Permission for Course*

Preparation of a research manuscript to be submitted to a peer-reviewed academic journal. Students will work with a faculty mentor on a research project. (Typically Offered: Fall, Spring, Summer)

**MIS 6510: Research Practicum II**

Credits: 1.

*Prereq: Instructor Permission for Course*

Preparation of a second research manuscript to be submitted to a peer-reviewed academic journal. Although students work under the supervision of a faculty mentor, the students will take independent responsibility for the research project.

**MIS 6550: Organizational and Social Implications of Human Computer Interaction**

(Cross-listed with HCI 6550).

Credits: 3. Contact Hours: Lecture 3.

Examine opportunities and implications of information technologies and human computer interaction on social and organizational systems. Explore ethical and social issues appurtenant to human computer interaction, both from a proscriptive and prescriptive perspective. Develop informed perspective on human computer interaction. Implications on research and development programs.

**MIS 6990: Research**

Credits: 3-6. Repeatable.

*Prereq: Instructor Permission for Course*

Research. (Typically Offered: Fall, Spring, Summer)