INFORMATION SYSTEMS AND OPERATIONS MANAGEMENT (ISM)

ISM 110 Foundations for Analytics using Spreadsheets 3
The course develops introductory spreadsheet skills. Topics focus on the creation of effective spreadsheets and reports and the management of datasets to solve business problems.
Notes: Open to freshmen and other students seeking an introduction to computer usage.

ISM 116 Web Design and Development 3
Students learn skills needed to design effective Web pages by studying the best practices in website design.
Prerequisites: C or better in ISM 110 or equivalent.

ISM 201 Essentials of Cyber Security 3
This course provides an overview of cyber security essentials. Any loss of data or compromise devastates a corporation. This course covers essential aspects of cyber security management.

ISM 210 Principles of Business Analytics 3
Principles of Business Analytics introduced students to the advanced techniques in the use of business computing applications, including spreadsheets, database systems, and linkage between applications to enhance productivity. Students study how end-user applications are managed and contribute to business.
Prerequisites: Grade of C or better in ISM 110.

ISM 218 Database Management and Cloud Systems 3
Study of database management systems with a focus on both traditional and cloud-based database design, implementation, query and use. Includes an extensive case study requiring the development of a database system for organizational needs.
Prerequisites: Grade of C or better in ISM 110.

ISM 240 Programming for Analytics and AI 3
Learn fundamentals of programming with focus on analytics and AI. Explore modern programming techniques for business problems in analytics, predictive modelling, machine learning, and integrating hands-on Gen AI programming knowledge.
Prerequisites: Grade of C or better in ISM 110 or equivalent.

ISM 280 Information Systems for Decision Making 3
The course covers the fundamentals of business information systems in the context of a modern organization. Topics focus on the use of information systems, technologies and business analytics for decision making and competitive advantages.
Prerequisites: ISM 110 or equivalent.

ISM 301 Systems and Process Analysis 3
Focuses on systems and process concepts such as automation boundaries, feasibility assessments, performance measures, information modeling, process reengineering, quality, and value added. Course emphasizes analysis methodologies.
Prerequisites: ISM 218 or concurrent enrollment in ISM 218. PCYB, CYBE, PISC, ISSC, or ISCI major.

ISM 310 Business Programming II 3
Study of advanced procedural software structures such as multidimensional arrays and tables, indexed file processing, and interactive processing. Introduction to object oriented software structure such as class definitions, object instances, and class methods.
Prerequisites: C or better in ISM 240.

ISM 312 Principles of Generative AI for Business 3
Students will learn the fundamentals and background of generative AI, Large Language Models with a focus on practical applications, prompt engineering, governance, ethical and responsible use of AI.
Prerequisites: C or better in ISM 110.

ISM 324 Secure Networked Systems 3
Networking and telecommunication concepts are described. Technical and organizational activities for securing distributed systems are presented. System security and information assurance methodologies, procedures and best practices are studied.
Prerequisites: Grade of C or better in ISM 201. Restricted to IS majors, CYBE majors, and Information Technology minors only.

ISM 325 Topics in Applications Development 1-3
Study of specific application development environments and development tools to support business application development.
Prerequisites: ISSC or CYBE Major.

ISM 326 Ethical Hacking, Security Compliance, and Risk Management 3
Covers security compliance and risk management policy, frameworks, assessment, and incident response. Employ ethical hacking as authorized testing to identify exploitable vulnerabilities and propose mitigations through hands-on labs and reporting.
Prerequisites: C or better in ISM 201. Admitted to ISSC major or CYBE major.

ISM 328 Blockchain Technology Applications and Management 3
Evaluate strategies to protect data, including cryptographic systems and their use in real world applications. Examine latest developments in blockchains and their role in security and data management.
Prerequisites: C or better in ISM 201. Restricted to ISCI students and students who are Pre admitted to or admitted to majors in the Business School (PACC, ACCT, PBAD, BADM, CARS, PCYB, CYBE, PECO, ECON, ECOS, PENT, ENTR, PFIN, FINC, PHTM, HTMT, PHUR, HURM, PINT, INTB, PISC, ISSC, or PMKT, MKTG).

ISM 411 Undergraduate Internship in Information Systems 1-3
This course provides students with the opportunity to apply classroom knowledge and skills to a business situation and develop new work management skills and understandings.
Prerequisites: Admission to the ISSC major or CYBE major and approval of instructor.
Notes: May be repeated for credit for a maximum of 6 s.h.

ISM 425 Business Analytics 3
Study of the techniques and methods of business analytics, including gathering, processing and analyzing large volumes of data to generate insights that inform business decisions.
Prerequisites: ECO 250 or STA 108 and either ISM 210 or ISM 218 or ACC 325. ISSC Major or CYBE Major or ACCT Major.

ISM 452 AI-Enabled Design of Management Information Systems 3
AI-enabled development of cost effective computer-based systems to produce information needed for managerial decision making as specified in the information analysis phase.
Prerequisites: C or better in ISM 218, and two courses from ISM 240, ISM 312, ISM 324, ISM 425.

ISM 498 Independent Study 1-3
Individual study of issues or problems in information systems and/or supply chain management. Student must arrange time and course requirements with instructor prior to registration.

ISM 499 Problems in Information Systems and Supply Chain Management 3
Independent study and research with class discussion covering a topic or group of related topics of current interest in information systems and/or supply chain management.
Prerequisites: Permission of instructor.
Notes: May be repeated for credit with approval of Department Head.

ISM 613 Directed Studies 1-3
Individual study problems in the field. Regular conferences with instructor required.
Prerequisites: Permission of MSITM Program Director and instructor who will supervise study.

ISM 635 Principles of Enterprise Resource Planning using SAP 3
A problem-based approach to SAP and Enterprise Resource Planning concepts. Hands-on learning of integrated SAP software modules for business processes such as sales, logistics, material management, procurement, and human resources.
Notes: Same as SCM 635.

ISM 638 Cloud Computing and Security Analytics 3
Covers cloud computing theories and concepts in the context of business organizations. Also provides instruction related to security analytics using cloud computing technologies.

ISM 645 Principles of Predictive Analytics 3
Predictive analytics are iteratively generated by analyzing and exploring enterprise data to predict relationships and generate insights for organizations. Principles, models, and methods of predictive analytics are discussed.

ISM 646 Visualizing Data to Design Strategy 3
Data are analyzed to answer questions. Students are exposed to concepts and techniques to understand analytics results and appropriately infer relationships to answer questions and visualize results using contemporary techniques.

ISM 647 Artificial Intelligence and Machine Learning Applications for Business 3
Cognitive computing and artificial intelligence based applications are increasingly employed by businesses to generate insight from data. Students are introduced to principles, techniques, and models for developing these systems.

ISM 663 Deep Learning Applications for Business 3
Covers fundamental principles, concepts and theories and implementation details related to deep learning technologies. Includes common neural network architectures such as Multi-layer Perceptron (MLP), Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), LSTM and Transformer architectures and their applications in business.

ISM 664 Generative AI for Business 3
Focuses on Generative AI applications in Business, primarily on Large Language Models (LLMs) and Generative AI related to Image, Audio and Video Generation. Covers Transformer Architecture, Generative Modeling, Variational Autoencoders, Generative Adversarial Networks in the context of business applications and decisions.

ISM 665 Principles of Cyber Security 3
Study of the technical, managerial, and organization issues in systems security, including systems security models, analysis of business process and technology for systems security, and information assurance.

ISM 666 Blockchains and Cryptography 3
Evaluate strategies to protect data, including cryptographic systems and their use in real world applications. Examine latest developments in blockchains and their role in security and data management.

ISM 667 Global Cyber Threat Analysis 3
The course focuses on evaluating global cyber threats because of cyber weapons, cyber warfare, and other criminal activities. The course also evaluates defensive strategies and necessary capabilities to combat threats.

ISM 668 Enterprise and IT Risk Management 3
Focus on enterprise and IT risk identification, evaluation, mitigation, and risk-related decision making, given the resource constraints. Students learn foundational theories and framework in risk management. Standard risk management approaches for identifying, analyzing, and responding to risks are introduced. Tools and methodologies for metrics to monitor risk management activities presented.

ISM 670 IT Driven Disruptive Innovation Management 3
Examines the role of disruptive and emerging IT in reshaping business models, strategy, economies, and society by fueling disruptive product and process innovation. Explores processes and governance for IT-driven disruptive innovation.

ISM 671 Organizing Data for Analytics 3
Fundamental concepts of database management systems, including database design, implementation, and the use of the SQL query language.

ISM 672 App Design and Programming 3
Apply fundamental programming concepts in designing and implementing applications for the web. This course provides students the necessary foundations for developing web applications and evaluating entrepreneurial opportunities.
Notes: Same as ENT 672.

ISM 673 Designing Secure Computer and IoT Networks for Business 3
Technology related to internal and external network/telecommunication services. Managerial and business issues related to the identification, acquisition, and management of network/telecommunications services in the contemporary enterprise.

ISM 677 Information Systems Management 3
Examines the role of information technology to improve processes and business performance, analyze the interaction of business strategies, work processes, competitive markets, technology and people for effective IT management.

ISM 678 Project Management for Dynamic Environments 3
Modern methods of defining, planning and executing large IT and other projects. Computer software and network modeling are used to support the efficient scheduling of interdependent activities.
Notes: Students may not earn credit for both ISM 654 and 678.

ISM 688 Projects in Business Analytics 3
A capstone experience in which the students demonstrate a broad knowledge of Business Analytics by undertaking hands-on projects with realistic data.

ISM 695 Special Topics in IT 1.5
Specific course title identified each time the course is offered. Selected topics will address contemporary issues in information technology and its management.
Prerequisites: Admission to MSITM degree program and permission of MSITM Program Director.
Notes: Course may be repeated for credit when topic varies.

ISM 696 Organizational Internship 1-3
Academic and required work components allow students to gain organization experience. Course supervised by a designated graduate faculty member and an organization manager.
Prerequisites: Permission of MSITM Program Director.
Notes: May be repeated for credit.

ISM 698 Project in Information Technology 3
Capstone experience in which the student demonstrates a broad knowledge of the material covered in the MSITM curricula by undertaking a project approved in consultation with the MSITM Program Director.
Prerequisites: Completion of at least 18 credits of required coursework for MSITM.

ISM 699 Thesis 1-6
An independent, theory-based inquiry in which a student applied knowledge and skills acquired to the scholarly study of information technology and management.

ISM 701 Predictive Analytics in Information Systems Research 3
Introduction to various techniques available for extracting useful information and business value from the large volume of rich data at the disposal of organizations. Covers the concepts, principles, methodologies, and emerging trends in data mining and predictive analytics. Exposure to research questions that lend themselves to use of predictive analytics.
Prerequisites: Admission to ISSCM Ph.D. program or permission of instructor.

ISM 702 Data Visualization for Information Systems Research 3
Data are analyzed to answer questions. Students are exposed to concepts and techniques to understand analytics results and appropriately infer relationships to answer questions and visualize results using contemporary techniques.
Prerequisites: Admission to the ISSCM Ph.D. program or permission of instructor.

ISM 703 Cognitive Computing and Artificial Intelligence in Information Systems Research 3
Cognitive computing and artificial intelligence based applications are increasingly employed by businesses to generate insight from data. Students are introduced to the current and emerging research opportunities in all aspects these systems.
Prerequisites: Admission to ISSCM Ph.D. program or permission of instructor.

ISM 704 Cyber Security Principles in Information Systems Research 3
Study of the technical, managerial, and organizational issues in systems security, including systems security models, analysis of business processes and technology for systems security, and information assurance. Research issues and trends are identified and discussed.
Prerequisites: Admission to ISSCM Ph.D. or permission of instructor.

ISM 705 Blockchains and Cryptography in Information Systems Research 3
Evaluate strategies to protect data, including cryptographic systems and their use in real world applications. Examine latest developments in blockchains and their role in security and data management. Identify and discuss contemporary research issues and trends.
Prerequisites: Admission to ISSCM Ph.D. or permission of instructor.

ISM 706 Global Cyber Threats and Risk Management 3
The course introduces proactive methodologies for delivering mitigation strategies to protect against today's sophisticated threats. The course focuses on the global nature of threats and the formation of dark markets. Research trends and opportunities are identified and discussed.
Prerequisites: Admission to the ISSCM Ph.D. program or permission of instructor.

ISM 707 Information Technology Driven Disruptive Innovations 3
This course covers both conceptual and practical aspects of IT driven disruptive innovation management. This course primarily focuses on emerging information technologies that drive disruptive innovation and the research issues and opportunities that arise.
Prerequisites: Admission to ISSCM Ph.D. program or permission of instructor.

ISM 708 Generative AI for Business and Information Systems Research 3
Focuses on Generative AI applications in Business and Information Systems Research, primarily on Large Language Models (LLMs) and Generative AI related to Image, Audio and Video Generation in the context of information systems research related to business organizations. Explores various research questions and topics.
Prerequisites: Permission of the Graduate Program Director.

ISM 709 Deep Learning Applications for Business and Information Systems Research 3
Covers fundamental principles, concepts and theories and implementation details related to deep learning technologies and will include common neural network architectures such as Multi-layer Perceptron (MLP), Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), LSTM and Transformer architectures and corresponding research topics in the context of business.

ISM 710 Cloud Computing and Security Analytics and Information Systems Research 3
Covers cloud Computing, security analytics, and information systems research in the context of business organizations. Also provides instruction related to security analytics using cloud computing technologies. Research questions and topics related cloud computing and security analytics will be explored.
Prerequisites: Permission of the Graduate Program Director.

ISM 753 Information Systems Research Seminar I 3
Study of the principles of scientific inquiry and its applications in information systems research. Topics may include different types of knowledge generation, foundations of theory and research design alternatives.
Prerequisites: Admission to the Ph.D. in Information Systems or permission of the instructor.

ISM 754 Information Systems Research Seminar II 3
Current research issues on the intersection of information systems and supply chain systems. Topics may include blockchains, Internet-of-Things, information asymmetry and strategic inter-organizational information systems.
Prerequisites: Admission to the Ph.D. program in Information Systems or permission of instructor.

ISM 755 Information Systems Research Seminar III 3
Study of contemporary and emerging topics in information systems. Topics may include cybersecurity, social and crowd-based technologies, health information and health IT, and analytics, artificial intelligence and machine learning.
Prerequisites: Admission to the Ph.D. program in Information Systems or permission of instructor.

ISM 756 Information Systems Research Seminar IV 3
Application of various research techniques in information systems research Topics may include econometrics, game theory, analytical modeling, queueing models, decision theory; experiments, big data techniques, panel data analysis.
Prerequisites: Admission to the Ph.D. program in Information Systems or permission of instructor.

ISM 760 Contemporary Research Methods in Information Systems 3
Focuses on contemporary research methods for studying information systems phenomena, particularly those related to emerging technologies. Emphasizes enhancing doctoral students' ability to identify, examine, and evaluate different contemporary methodologies regarding philosophical underpinnings of the methodology and dominant research frameworks for use of those methodologies, research paradigms and theoretical conceptualizations.
Prerequisites: Admission to the ISSCM Ph.D. program or permission of instructor.

ISM 782 Practicum in IS Teaching 1-3
Supervised teaching of an information systems (IS) course. Faculty mentor will guide in planning and delivery.
Prerequisites: Permission of Ph.D. Director.
Notes: Course may be repeated for credit. Grading method is Satisfactory/Unsatisfactory (S/U).

ISM 783 Organizational Research Internship 3-6
Organizational work and research in information systems in actual organization. Expose student to practical and relevant research problems. Supervised by designated faculty member and organization manager.
Prerequisites: Permission of Ph.D. Director.
Notes: Grading method is Satisfactory/Unsatisfactory (S/U).

ISM 785 Theories of Information Systems 3
Examines underlying theories in information systems research. Theories from organizational behavior, strategic management, economics, other disciplines inside and outside business, and IS will be discussed.
Prerequisites: Permission of Ph.D. Director.

ISM 786 Principles of Scientific Inquiry in Information Systems Research 3
Introduction to topics ranging from the philosophical underpinnings of the field and the dominant research frameworks, paradigms, or theoretical conceptualizations. Discusses fundamentals of undertaking research, including defining problems, research questions, conducting a literature review, collecting evidence, interpreting findings, and drawing conclusions and generalizations.
Prerequisites: Admission to ISM Ph.D. program or permission of Ph.D. Director.

ISM 788 Seminar in IS Research Methods 3
Research process and various design elements for quantitative and qualitative research in information systems.
Prerequisites: STA 661, STA 662, and permission of Ph.D. Director.

ISM 789 Research Seminar in Information Systems 1-3
Explores current and emerging research topics in information systems.
Prerequisites: ISM 786 or permission of Ph.D. Director.
Notes: May be repeated for credit.

ISM 790 Independent Doctoral Research 1-6
Individual work on research issues related to the student's primary area(s) of specialization. Work may consist of original research and/or critical examination and integration of existing literature.
Prerequisites: Permission of Ph.D. Director.

ISM 799 Dissertation 1-24
Dissertation.
Prerequisites: Admission to candidacy.

ISM 801 Thesis Extension 1-3
Thesis Extension.

ISM 802 Dissertation Extension 1-3
Dissertation Extension.

ISM 803 Research Extension 1-3
Research Extension.