

# INFORMATION SYSTEMS (ISMG)

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## ISMG 5939 - Internship (1-3 Credits)

Supervised experiences involving the application of concepts and skills in an employment situation. Repeatable. Max hours: 9 Credits.

Grading Basis: Pass/Fail Only

Repeatable. Max Credits: 9.

## ISMG 6020 - Programming Fundamentals with Python (3 Credits)

This course is designed to provide a thorough introduction to Python and fundamental programming concepts like data structures, networked application program interfaces, files and databases. Principles of object-oriented programming and secure programming practices are demonstrated using programming constructs taken from the business domain. Students are required to design and create their own applications for data retrieval, processing, and visualization. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Spring.

## ISMG 6028 - Travel Study Topics (3 Credits)

Join your classmates in an international travel study course to understand the business operations of another culture. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

## ISMG 6040 - Business Process Management (3 Credits)

Designing effective information systems for business requires an awareness of the organization(s) business processes and how to manage and streamline them. The objectives of the course are for students to understand the importance of business processes; the main types of business processes; and the evolution of business process management; business process outsourcing; business process re-engineering; business process redesign; technology enabled business processes; and automated workflow. An important activity is graphically mapping business processes, which are transformed into an application or set of applications. The organization needs to manage the electronic workflow to monitor that the work gets done and allow changes to the workflow. Case studies of organizations are studied for most topics to enhance understanding. The group projects let students apply their knowledge of the course to a specific organization. By the end of this course students should have an appreciation of the important process-centric issues in business systems design. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Spring.

## ISMG 6060 - Analysis, Modeling and Design (3 Credits)

Provides an understanding and application of systems analysis and design processes. Students are exposed to system development life cycle (SDLC), structured systems analysis and design methods, object-oriented analysis and design methods, prototyping and commercial off-the-shelf package software approaches, and joint and rapid application development. Emphasizes the skills required for system analysts such as analytical, interpersonal, technical, fact-finding, and project management skills. Topics include data, process and object modeling, input-output and user interface design, and systems implementation and support. To provide an opportunity to develop these skills, an information system project is completed by a group of students. Students use a Case tool for their group project. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Spring.

ISMG 6071 - Introduction to Health Information Technology (3 Credits)  
Examines what needs transforming in healthcare to improve value, safety and appropriateness of care, and what the role of IT is in that transformation. It also examines the challenges of cultural change and IT strategy in succeeding with clinical information projects. Differences between installation, implementation, transition and actual transformation are suggested and methods for managing subcultures in healthcare (IT, clinical, administrative) are reviewed. Cross-listed with HLTH 6071. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.  
Grading Basis: Letter Grade  
Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
Typically Offered: Spring.

ISMG 6072 - Fundamentals of Health Information Technology Management (3 Credits)  
Provides an introduction to the management of information technology in healthcare. A description of information processing, the origin, content, evolution of healthcare information systems and the methodologies deployed to acquire and manage information requirements are discussed. Cross-listed with HLTH 6072. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.  
Grading Basis: Letter Grade  
Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
Typically Offered: Fall.

ISMG 6080 - Database Management Systems (3 Credits)  
The success of today's business often hinges on the ability to utilize critical information to make the right decisions quickly and efficiently. Transforming mountains of data into critical information to improve decision making is a skill every business decision maker must possess. This focus course covers the database design topics with a focus on enabling business decision making. Detailed topics include collecting, capturing, querying and manipulating data (using SQL and QBE) for simple to medium complex business applications. Commercial database products are utilized to demonstrate the design of database applications in management, marketing, finance, accounting, and other business areas. Students will be able to design and implement simple to medium complex database applications after successful completion of this course. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
Typically Offered: Fall.

ISMG 6120 - Network Design and Analysis (3 Credits)  
Communication, knowledge sharing, and information acquisition within and between businesses are critical for long term strategic business success. Technological advancements are radically changing the way business communication and knowledge sharing are performed. This course will briefly examine the traditional concepts of local and wide area networks for reference purposes, but then will focus on how newer technologies are changing business practices. Traditional local and wide area network concepts that will be covered in this course include WiFi wide area networks, wireless local area networks, cellular networks, and additional supporting services. Newer technologies that will be covered include social computing, Internet of Things, and artificial Intelligence. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
Typically Offered: Fall.

ISMG 6180 - Information Systems Strategy (3 Credits)  
Digital strategy is the application of digital technologies to business models to form new differentiating business capabilities. The course starts with the highlights of genesis and importance of IT in organizations, including the relationship between digital technology and competitiveness. Then, the development and management of an effective digital infrastructure are discussed. Realizing that the effective use of digital technology requires the alignment of competitive strategies, business processes, and applications, the course takes a top management perspective on the development of policies and plans that maximize the contribution of digital technologies to organizational goals. A broad overview of how systems support the operational, administrative, and strategic needs of organizations is covered. Cross-listed with BUSN 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
Typically Offered: Fall, Spring, Summer.

**ISMG 6200 - Global Information Systems (3 Credits)**

Will focus on managing information technology globally and the new organizational and information technology designs that firms are establishing to meet the ever-growing global requirements. The course will cover such issues as how information is used and how information technology is deployed by multinationals in different countries, the state of information technology and telecommunication industries in countries around the world, how global firms gain strategic benefits from information technology, and how firms manage and use global virtual teams. Prereq: ISMG 6040 or 6120 or BUSN 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Fall.

**ISMG 6220 - Business Intelligence Systems and Analytics (3 Credits)**

This course covers business intelligence, analytics, and artificial intelligence technologies and is organized around three types of analytics that are enabled by those technologies: descriptive, predictive, and prescriptive analytics. The theme of artificial intelligence runs throughout the course from business intelligence, to machine learning and deep learning as applied in areas such as computer vision, autonomous vehicles, and robots. The topics will be discussed using concepts and theory, business cases and applications, and hands-on analysis or model building using datasets available in the public domain, with the hands-on analysis and model building being the focus of the course. Students will use a leading BI software and a cloud computing platform to perform analysis and build machine learning models. Note: The recommended prerequisite for this course is ISMG 6080. If you are familiar with SQL and have worked with databases in the past, you satisfy the prerequisite requirement for this course. Cross-listed with BUSN 6812/ISMG 6220. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Spring, Summer.

**ISMG 6240 - Website Development Practice and Technologies (3 Credits)**

Presents a broad coverage of design principles and techniques to develop effective web sites. The course emphasizes: (1) understanding the principles of web page and web site design and the process of publishing web pages, (2) developing client-side scripts for use in web sites, (3) using server-side programs or scripts to develop dynamic web sites using databases, and (4) understanding technologies for managing large web sites including XML schemas, content management systems and web services. If you have relevant experience in database and programming please contact the instructor for permission to waive the prerequisite of ISMG 6020. Prereq: ISMG 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: ISMG 6020. Restriction: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

Typically Offered: Fall.

**ISMG 6280 - Service Oriented Architecture (3 Credits)**

Explores "Service Oriented Architecture" (SOA), which refers to a design pattern made up of components and interconnections that stress interoperability and location transparency. Covers the latest heterogeneous models for carrying out large scale distributed computing using Web services. The fundamentals of defining, designing, building, testing and rolling-out a SOA system are explored using tools from major Web service vendors. Also, looks at the impact of SOA on software quality, efficiency, performance and flexibility. Prereq: ISMG 6020.

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Fall.

**ISMG 6320 - Innovative Health Information Technologies (3 Credits)**

Learn how innovative health info technologies shape and redefine healthcare by enhancing medical care through scope and scale effects, providing tech efficiencies in delivery of care, utilizing advance tools for patient Ed and self-care, network-integrated decision support, e-business models & opportunities for e-health. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6340 - Cloud Computing Concepts, Tools, and Security (3 Credits)**

This course provides an introduction to cloud computing concepts, capabilities, and scenarios where cloud computing technology can be leveraged. Students will learn the basic building blocks of cloud computing, investigate the various types and models of cloud computing, and identify how businesses can implement these technologies. This class uses hands-on labs to give students real-world practice on how to configure and secure a cloud computing environment. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6420 - Global Enterprise Systems (3 Credits)**

Examines the evolution of global enterprise systems - from internally focused enterprise resource planning (ERP) client or server systems to externally focused eBusiness. Studies the types of issues managers need to consider in implementing cross-functional integrated enterprise systems. Examines the general nature of global enterprise computing, re-engineering principles and the technical foundations of client or server systems and enterprise information architectures. Students learn about the global enterprise systems marketplace. Topics include the tools and methodology, modules, processes and industry initiatives. Finally, the course looks into the future and predicts enterprise system trends. The objective of the course is to make students aware of the potential and limitations of global enterprise systems. The objective will be reached through case studies, lectures, guest speakers and a group project.

Coreq: ISMG 6180 or BUSN 6610. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Fall.

**ISMG 6430 - Information Systems Security and Privacy (3 Credits)**

Designed to develop knowledge and skills for security of information and information systems within organizations. Focuses on concepts and methods associated with planning, designing, implementing, managing, and auditing security at all levels and on all systems platforms, including enterprise systems. This course presents techniques for assessing risk associated with accidental and intentional breaches of security as well as disaster recovery planning. For the best outcome it is recommended that you complete ISMG 6180 or BUSN 6610 prior to taking this course or during the same term as you take this course. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Spring.

**ISMG 6450 - IT Project Management (3 Credits)**

Focuses on how firms successfully manage the adoption of It. Projects and program management principles are the primary focus of this course. Topics covered include approaches to prioritizing projects, estimating cost and time-to-market, build vs. buy decision, planning, monitoring and controlling implementation, measurement, total cost of ownership, effective management of both behavioral and technical aspects of the project and change management. For the best outcome it is recommended that you complete ISMG 6180 or BUSN 6610 prior to taking this course. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Typically Offered: Fall.

**ISMG 6460 - Emerging Technologies (3 Credits)**

Provides an introduction to the expansive array of information technologies that form the infrastructure of a modern business enterprise. Emphasis is placed on learning conceptual technological foundations and understanding the business value of the various technologies. The purpose of the course is to develop the student's ability to discuss recent technological advancements with other It professionals and management. Technology assessment is emphasized. Prereq: ISMG 6180 or BUSN 6610 (6810). Restriction: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Cross-listed with BUSN 6800. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: ISMG 6180 or BUSN 6610 Restriction: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Typically Offered: Fall.

**ISMG 6470 - Text Data Analytics (3 Credits)**

This course covers algorithms and tools that are required to perform quantitative analyses of unstructured text data. Concepts and algorithms that will be covered include Zipf's Law, Power Law Distribution, Pattern Discovery, Inverse Document Frequency, measurements of Document Clustering and Similarity and so on. R will be introduced as a practice tool to practice quantitative analysis of text data. After the completion of this course, students will be able to uncover and visualize underlying themes and concepts which might be latent in large text documents. Note: The recommended prerequisite for this course is ISMG 6020. If you are familiar with programming and have worked with programming languages in the past, you satisfy the prerequisite requirement for this course. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors



**ISMG 6480 - Data Warehouse and Administration (3 Credits)**  
 Management of large, complex data warehouses and operational databases involves technical skills and background needed by information systems professionals as well as tactical and strategic issues faced by information technology managers. This course provides conceptual knowledge, practical skills, and policy background for prospective information systems professionals and information technology managers. The course covers business aspects, conceptual background, and product material about management of data warehouses and operational databases. Assignments and projects involve Oracle skills for database administration and tactical or strategic issues faced by information technology management. Prereq: ISMG 6080. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.  
 Grading Basis: Letter Grade  
 Prereq: ISMG 6080 Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
 Typically Offered: Spring.

**ISMG 6510 - Accounting and Information Systems Processes and Controls (3 Credits)**  
 Designed to develop knowledge and skills used to understand and evaluate corporate accounting processes and systems. Focuses on financial and information system internal controls and the flow of corporate information through an accounting system. A financial system objective and risk assessment approach issued to present concepts and techniques for evaluating the adequacy of system processes and controls. Cross-listed with ACCT 6510, 4780 and ISMG 4780. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.  
 Grading Basis: Letter Grade  
 Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6800 - Special Topics (3 Credits)**  
 A variety of advanced topics are offered in this course. Past topics include the human-computer interface, software engineering, artificial intelligence, graphical user interface, project management and electronic commerce. Consult the current 'Schedule Planner' for semester offerings. Note: Seldom offered. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Repeatable. Max hours: 15 Credits.  
 Grading Basis: Letter Grade  
 Repeatable. Max Credits: 15.  
 Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6810 - Business Intelligence in Healthcare (3 Credits)**  
 Provides students with an overview of how business intelligence is used in the healthcare industry. Students study the evolution of IT in healthcare including digitization of electronic health records and systems integration. Next the course looks at healthcare transformation and the evolution of business intelligence in general. Using case studies and hands on exercises, students learn about different aspects of business intelligence in various subsets of the healthcare industry. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.  
 Grading Basis: Letter Grade  
 Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
 Typically Offered: Fall.

**ISMG 6820 - Business Intelligence and Financial Modeling (3 Credits)**  
 This course will introduce students to the application of business intelligence in a corporate finance setting. Financial data intelligence is essential for effective decision making throughout the firm, in finance directly and in other functions supported by the finance department. Strategy setting, budgeting, and new product development are just a few decision areas where finance personnel play an active role. In this course, we learn how to apply business intelligence software tools to enable finance personnel to access and analyze corporate data in support of critical decision making across the enterprise. Students will also analyze data through the use of financial models built in Microsoft Excel. The development of complex financial models will provide students with valuable hands-on experience with a software tool used widely incorporate finance departments. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Cross-listed with ISMG 4750 and FNCE 4750. Max hours: 3 Credits.  
 Grading Basis: Letter Grade  
 Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors  
 Typically Offered: Spring.

**ISMG 6830 - IT Governance and Service Management (3 Credits)**  
 Deals with interrelated decisions on clarifying the business role of IT, defining integration and standardization requirements for the IT architecture, shared and enabling services for the IT infrastructure and business need for SaaS, and governance of cloud computing, IT outsourcing, and other IT services. Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.  
 Grading Basis: Letter Grade  
 Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

## ISMG 6840 - Independent Study: ISMG (1-8 Credits)

Instructor approval required. Allowed only under special and unusual circumstances. Regularly scheduled courses cannot be taken as independent study. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Repeatable. Max Hours: 8 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 8.

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

## ISMG 6850 - Securing the Enterprise (3 Credits)

This course provides the knowledge required to analyze the current enterprise environment in order to prepare a risk mitigation for security vulnerabilities encountered. Topics include principles and concepts; threats, vulnerabilities, risks, attacks and controls; risk process and management; and enterprise security policies. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

## ISMG 6855 - Protecting the Enterprise (3 Credits)

This course examines methods and techniques used to secure an enterprise's environment. Topics include threat prioritization and mitigation; social engineering and security policies; encryption and cryptography; virtual private networks, wireless and mobile device management; antivirus, intrusion detection and protection systems; and firewalls and proxy servers. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

## ISMG 6860 - Ethical Hacking Concepts and Methodologies (3 Credits)

From a technical perspective, organizations need to know how hackers work so that they can build their security around it and take preemptive measures against future attacks. The goal of the ethical hacking is to understand current exploits, and assess weaknesses and vulnerabilities of various organizational information systems by attacking them within legal limits. This course is designed to provide students an insight of current hacking tools and techniques used by hackers and security professionals to break into any computer systems. Throughout the course, students will engage in offensive and defensive hands-on exercises stressing ethical hacking and penetration testing that will be conducted in a vendor-neutral virtual environment. Topics include security threats and attack vectors, footprinting and reconnaissance, network scanning and enumeration techniques, vulnerability assessment, system hacking, malware threat analysis, social engineering, attack and defense strategies in emerging technologies. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

## ISMG 6865 - Digital Forensic Analysis (3 Credits)

This is an introductory course in collecting, examining, and preserving evidence involving digital devices. This course examines the issues, tools, and control techniques needed to successfully investigate illegal or malicious activities facilitated through the use of information technology. The tools of collecting, examining, and evaluating data in an effort to establish intent, culpability, motive, means, methods, and loss resulting from these crimes will be examined. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

## ISMG 6870 - Securing Information Assets (3 Credits)

This course concentrates on the identification of information assets and the techniques used to protect them from unauthorized access. Topics include laptops, desktop and server vulnerabilities; network vulnerabilities; extranet and intranet management; incident response and management; web site and web services management; virtualization in the data center; and cloud computing security. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6875 - Protecting Information Assets (3 Credits)**

This course illustrates how information assets can be subjected to internal and external attacks and presents techniques used to secure them from unauthorized access. Topics include sub-networking for guest and vendor access; managing mixed operating system environments; data at rest and data in-transit; database inference; network management systems and security; information assurance tools and techniques.

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6880 - Intrusion Detection and Incident Response (3 Credits)**

A topic of increasing importance and interest in the world of information systems and business is malicious intruder detection and the response procedures required to secure business systems once an intrusion has occurred. It is critical that the organizations dependent on information technology have incident handling procedures when computer intrusions occur. By having proper incident response procedures, organizations can quickly recover from intrusions and where feasible bring perpetrators to justice. This course will provide the student the opportunity to learn about the elements that comprise Intrusion Detection and Incident Response. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6885 - Ethics: A Formula for Success (3 Credits)**

Students will learn how to spot and address red flags that foster unethical behavior in both publicly-traded and privately-held businesses. Governance and stakeholder management techniques that incentivize ethical behavior will be highlighted using examples of companies that are financially successful by "doing the right thing." Principle-based ethics are emphasized, namely, integrity, trust, accountability, transparency, fairness, respect, viability, and compliance with the rule of law. Cross-listed with MGMT 3420, MGMT 6420, ISMG 4785. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to graduate business school students.

**ISMG 6890 - IT Risk Management (3 Credits)**

This course provides an overview of IT risk management practices. Students will learn the elements of risk management and the data necessary for performing an effective risk assessment. Various risk management models will be introduced to demonstrate the methods that can be implemented to achieve Confidentiality, Integrity, and Availability of information systems. This class uses hands-on labs to give students real-world practice utilizing Security Information and Event Management (SIEM) software to gain an understanding of how to detect and respond to a cyber threat. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

**ISMG 6895 - Digital Forensic Analysis II (3 Credits)**

This course examines advanced digital forensic analysis topics, tools, techniques, and control mechanisms. Advanced topics include operating system artifacts, anti-forensics, mobile and embedded devices, and volatile memory forensics. Students will gain experience with state-of-the-art forensics tools and techniques needed to successfully investigate illegal activities perpetuated through the use of information technology.

Prereq: ISMG 6860 and ISMG 6865. Restriction: Restricted to Graduate Business School students. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: ISMG 6860 and ISMG 6865 Restriction: Restricted to Graduate Business School students

**ISMG 6910 - Design Science Practicum (3 Credits)**

This is designed to be one of the final courses in the MS Information Systems degree. "Design Thinking" with user-centered perspectives will serve as a guiding principle to challenge assumptions and refine business problems to perform the final project. The instructor will provide students with tools and methods to identify, define and solve problems. Active discussion and creative presentation are core activities of this capstone course. Students will integrate what they have learned into a final project that can be either real-world problem designed in collaboration with an organization or a research paper on an emerging topic in the field. The final project will have multiple deliverables including a paper and a professional presentation to stakeholders who are directly related with the business problems defined in the project. Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

## ISMG 6950 - Master's Thesis (1-8 Credits)

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Repeatable. Max hours: 8 Credits.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 8.

Restrictions: Restricted to graduate majors and NDGR majors with a sub-plan of NBA within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors

Additional Information: Report as Full Time.

## ISMG 7001 - AI-Based Decision Making (3 Credits)

Introduces decision making concepts. It covers a range of approaches, techniques and tools for decision aiding and describes how they can be used to support decision processes. The topics include human decision making, decision support systems, knowledge-based systems, and AI methods that support decision making, like machine learning, Bayesian networks and association rules. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

## ISMG 7002 - Computer Security (3 Credits)

A broad overview of computer security, roughly divided into three unequal components: a) the history of codes and ciphers; b) basic cryptographic techniques, for example, symmetric cryptography, authentication techniques, and asymmetric cryptosystems, and: c) applications to current and future computer-related technologies, for example, network security, wireless communication, quantum cryptography, and more.

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with CSCI 7002. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

## ISMG 7200 - Advances In Management Information Systems (3 Credits)

Provides an introduction to research methodologies engaged in Management Information System Research, including measurement, sampling, survey research, experiments, quasi-experiments and some qualitative research methods. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with CSCI 7200. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

Typically Offered: Fall.

## ISMG 7208 - Philosophy of Information Systems Research (3 Credits)

This course surveys the philosophical foundations that underlie the development of IS theories, research methods and measurements. The focus is placed on intensive and rigorous readings and critiques of key literature at the intersection of philosophy, sociology, history and information systems. Upon the completion of this course, students are expected to have enhanced capabilities to discern the ontological and epistemological boundaries of various IS theories and research methods so that they can carry out IS research with informed knowledge.

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

## ISMG 7210 - Topics In Analytical Research In Management Information Systems (3 Credits)

Provides a detailed coverage of selected analytical research in information systems. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with CSCI 7210. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

## ISMG 7211 - Topics In Behavioral and Organizational Research In Management Information Systems (3 Credits)

Provides a detailed coverage of selected behavioral and organizational research in information systems. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with CSCI 7211. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

## ISMG 7212 - Strategic and Organizational Research in IS (3 Credits)

This course examines concepts in information technology with an emphasis on organizations, organizational strategy, and competitive advantage. Using a seminar method, students will be introduced to foundational concepts and current knowledge in the IT-based research areas of information and organizational economics, boundaries and markets, firm performance, organizational capabilities, innovation, organizational design and management mechanisms, and the challenges to achieving competitive advantage over competitors. Through completion of this course, students should acquire the ability to evaluate organization-focused IT research and identify valued questions that can be examined in future research. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.



**ISMG 7214 - Mixed Methods Research (3 Credits)**

This course focuses on techniques for designing and executing mixed methods research in information systems area. Students will review the philosophical foundations of both qualitative and quantitative foundation. Basic practice, effective use and avoidance of pitfalls in mixed methods approach will be discussed. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

**ISMG 7220 - Research methods: Design and Analysis (3 Credits)**

Research methods: Design and Analysis. Topics include: research design, approaches to gathering data; sampling methods; linear multivariate analysis methods emphasizing structural equations models; and a brief survey of other methods such as cluster analysis, multidimensional scaling, methods such as neural nets, CART and/or genetic algorithms. While much of the material is of general interest, the course emphasizes methods and situations to prepare students in the CS/IS Ph.D. program for research in their field(s). The course includes student projects involving the analysis of data using appropriate software, whose results are presented to the class. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with DSCI 6220. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

**ISMG 7551 - Parallel and Distributed Systems (3 Credits)**

Examines a range of topics involving parallel and distributed systems to improve computational performance. Topics include parallel and distributed programming languages, architectures, networks, algorithms and applications. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with CSCI 7551. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

**ISMG 7552 - Advanced Topics in Parallel Processing (3 Credits)**

Examines the advances of sequential computers for gaining speed and application of these techniques to high-speed supercomputers of today. Programming methodologies of distributed and shared memory multiprocessors, vector processors and systolic arrays are compared. Performance analysis methods for architectures and programs are described. Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors. Cross-listed with CSCI 7552. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to PhD majors within the Business School and within the College of Engineering, Design and Computing, PHCS PhD majors and PHIS PhD majors.

**ISMG 7574 - Advanced Topics in Operating Systems (3 Credits)**

Covers the advanced topics in operating systems by examining functionality and performance issues in CPU Scheduling, communications, distributed file systems, distributed operating systems, shared-memory multiprocessors and real-time operating systems. In addition to studying papers, reviews, and presentations, students carry out a semester long team project within the scope of one of the above topics. Prereqs: CSCI 3453 or CSCI 5573. Cross-listed with CSCI 7574. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

**ISMG 7582 - Artificial Intelligence (3 Credits)**

Approaches to design of systems for solving problems usually solved by humans, especially those related to intelligent decision making. Emphasis on various types of knowledge representation. Cross-listed with CSCI 7582. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

**ISMG 7654 - Algorithms For Communication Networks (3 Credits)**

Algorithmic and mathematical underpinnings of communication networks. A taxonomy of data-packet networks depending on modes of communication: Fixed-Interconnection networks, radio networks and multiple-access channel. Algorithms to implement packet routing, broadcasting and conflict resolution. Prereq: CSCI 5451. Cross-listed with CSCI 7654. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

**ISMG 7765 - Computer Networks (3 Credits)**

An in-depth study of active research topics in computer networks. Topics include: Internet protocols, TCP/UDP, congestion and flow control, IP routings, mobile IP, P2P overlay networks, network security, performance, and other current research topics. Prereq: Graduate Standing. Cross-listed with CSCI 7765. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

**ISMG 7799 - Topics in Network Computing (3 Credits)**

Studies the active research topics in network based computing such as Cluster, Grid computing, P2P Computing, Pervasive Computing. Workflow system and Cloud Computing. Students will study key papers in the literature, and submit a research term project. Prereq: Graduate Standing. Cross-listed with CSCI 7799. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

ISMG 7800 - Special Topics (3 Credits)

A variety of advanced topics are offered at the Ph.D. level in this course. Consult the current 'Schedule Planner' for semester offering. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

Typically Offered: Spring.

ISMG 7840 - Independent Study: Pre-Dissertation Research (1-9 Credits)

Conduct pre-dissertation research under the supervision of a faculty member. Prereq: BUSN 6530. Repeatable. Max Hours: 18 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 18.

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

ISMG 8990 - Dissertation Development (1-15 Credits)

Supports development of a dissertation in conjunction with a student's advisor. Prereq: Completion of first year and second year papers (ISMG 7840). Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors. Repeatable. Max hours: 15 Credits.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 15.

Restrictions: Restricted to graduate majors within the Business School, graduate majors within the College of Engineering, Design and Computing, PHCS PhD majors and PhD majors.

Additional Information: Report as Full Time.