Information Systems

Courses

INFSYS 1800 Computers and Information Systems: 3 semester hours
This course develops skills in technology awareness, computer fluency, computing devices, ethical use of the Internet, and business applications for problem solving, communicating, and making informed decisions, including word processors, presentation software, electronic spreadsheets, and database management systems. Students will gain skills in developing business applications and web pages. Credit cannot be granted for both CMP SCI 1010 and INFSYS 1800.

INFSYS 2800 Information Systems Concepts and Applications: 3 semester hours
Prerequisites: INFSYS 1800 or satisfactory performance on proficiency exam. This course provides an overview of the field of information systems including concepts of systems analysis and design, ethics in information systems usage, electronic business, database management, enterprise systems, information security, and JavaScript programming concepts. Business cases will be utilized to illustrate how information systems improve decision-making. Students will also gain valuable strategies for career development and networking.

INFSYS 3806 Managerial Applications of Object-Oriented Programming I: 3 semester hours
Prerequisites: INFSYS 2800 or CMP SCI 1250, and a minimum campus GPA of 2.0. This course provides an introduction to object-oriented programming. Topics include object-oriented design principles and choices, encapsulation, inheritance, and event-driven programming. Hands-on labs during class sessions and assignments help students develop applied programming skills.

INFSYS 3807 Legacy Systems: 3 semester hours
Prerequisites: A minimum campus GPA of 2.0. This course covers structured programming techniques for legacy business. Students will learn COBOL syntax, structure, design and best programming practices to create, maintain, debug, compile and execute COBOL programs.

INFSYS 3810 Information Systems Analysis: 3 semester hours
Prerequisites: A minimum campus GPA of 2.0 and INFSYS 3806 or permission of instructor. In this course, students will learn how to identify, evaluate, and document business systems using traditional and agile methodologies. This includes how to study systems’ ability to meet the business needs and information requirements of an organization, and defend alternatives that better meet needs. Students will conduct a systems analysis of an actual organization in project teams, including the identification of and defense of alternatives.

INFSYS 3815 Object-Oriented Applications in Business: 3 semester hours
Prerequisites: INFSYS 3806 and a minimum campus GPA of 2.0. This course provides a study of web application development using Java and JavaScript. Students will learn about Java Collections Framework, Spring, Hibernate, design patterns, software testing, and front-end web technologies.

INFSYS 3816 Managerial Application of Object-Oriented Programming II: 3 semester hours
Prerequisites: INFSYS 3806 and a minimum campus GPA of 2.0. This course builds on skills learned in INFSYS 3806 and focuses on contemporary client-server development environments and tools. Topics include database integration, web applications, and web services. Students will be provided hands-on application development experiences during class and in assignments.

INFSYS 3841 Enterprise Information Systems: 3 semester hours
Prerequisites: INFSYS 2800 and a minimum campus GPA of 2.0. This course provides students the skills and knowledge needed for roles as ERP business analysts, ERP configuration specialists, and consultants. Students will be introduced to integrated business processes through the application of SAP modules supporting Sales and Distribution (SD), Materials Management (MM), Financial Accounting (FI), Production Planning (PP), and Controlling (CO) as components of the SAP integrated business solution. Students will complete exercises to construct a functioning company operating in an integrated SAP R/3 environment.

INFSYS 3842 Data Networks and Security: 3 semester hours
Prerequisites: INFSYS 2800 and a minimum campus GPA of 2.0; or consent of instructor. This is a foundational course in data networking and network security. It covers the fundamentals of networking and security implications of data networks with hands-on exercises. Topics include networking layers and standardization of functionality across layers, wired and wireless Local Area Networks (LANs) along with switching and physical layer technologies, Internetworking, supporting and supervisory protocols; application layer protocols such as HTTP, and fundamentals of network security. Students will also learn about network protocol analyzers such as Wireshark, virtualization, and networking in virtual environments. Credit cannot be granted for both INFSYS 3842 and INFSYS 6836.

INFSYS 3843 Decision Support Systems for Business Intelligence: 3 semester hours
Prerequisites: SCMA 3300 and a minimum campus GPA of 2.0. This class examines the applications of data and analytics (models) to support the needs of decision makers. Descriptive, predictive and prescriptive analytics tools are coupled with Big Data and well-designed user interfaces to provide the necessary tools. Topics such as how to construct the data warehouse, how to clean and store data in the appropriate form, how to construct and implement a useful visualization of data, and how to construct and support decision makers are included. DSS component design in response to decision making and business intelligence needs are discussed.

INFSYS 3844 Developing Business Applications in .NET: 3 semester hours
Prerequisites: INFSYS 2800 and a minimum campus GPA of 2.0. This course will enable students to design, implement, and debug object-oriented and data driven business applications in C#.NET. Students will learn application design choices, object-oriented design principles, event-driven programming, user interface programming, user interface controls, data binding and database access, exception handling, debugging and effective ways of working with C#.NET.

INFSYS 3845 Database Management Systems: 3 semester hours
Prerequisites: INFSYS 2800, INFSYS 3816, ACCTNG 2400, and a minimum campus GPA of 2.0. This course provides an introduction to the design and use of databases in meeting business information needs. Topics include database planning, conceptual design, and data administration. The concepts are studied with projects involving the use of a current database management system.
INFSYS 3847 Web Design: 3 semester hours
Prerequisites: INFSYS 2800 and a minimum campus GPA of 2.0.
This course focuses on website planning, design, and construction. Topics include site structure, navigation, content management, markup languages, CSS, scripting languages, and important tools, libraries and frameworks.

INFSYS 3848 Introduction to Information Security: 3 semester hours
Prerequisites: INFSYS 2800 or consent of instructor and a minimum campus GPA of 2.0. This course provides an introductory survey of the vast field of Information Security (InfoSec). It intersects both management and technical aspects of security as relevant to organizations, governments, individuals, and society. Topics include fundamental principles of InfoSec and cyber defense, the threat environment, management of InfoSec in organizations, technologies and tools in InfoSec, cryptology/cryptography, web application security, and current issues. Hands-on labs expose students to basics of penetration testing, applications of cryptography, and vulnerability management. Course is open to all majors. Credit cannot be granted for both INFSYS 3848 and INFSYS 6828.

INFSYS 3858 Advanced Security and Information Systems: 3 semester hours
Prerequisites: INFSYS 3848 or Permission of Department Chair. This course builds upon the principles of information security. It covers topics ranging from networking, penetration testing, formal verification of systems, formal models of information flow and protection, distributed system authentication, protocol design and attack, computer viruses and malware, as well as intrusion and anomaly detection models. Students are exposed to virtualization, defensive security, offensive security, and other forms of cybersecurity. Credit cannot be granted for both INFSYS 3858 and INFSYS 6858.

INFSYS 3868 Secure Software Development: 3 semester hours
Prerequisites: A first course in programming such as INFSYS 3806 or consent of instructor. This course covers the concepts of software assurance and the fundamentals of the secure software lifecycle as it relates to software development. Students will experience the secure software lifecycle process by developing concrete artifacts and practicing in a lab environment. Credit cannot be granted for both INFSYS 3868 and INFSYS 6868.

INFSYS 3878 Information Security Risk Management and Business Continuity: 3 semester hours
Prerequisites: INFSYS 3848 or Consent of Instructor. This course provides students the tools and concepts necessary to plan for, prevent, and when needed successfully respond to disruptions in business operations. Topics covered include security policies, frameworks, information and materials management, risk management, and regulatory compliance. Credit cannot be granted for both INFSYS 3878 and INFSYS 6878.

INFSYS 3890 Internship in Information Systems: 1-3 semester hours
Prerequisites: Minimum business GPA of 2.5, minimum campus GPA of 2.0, completed and/or currently enrolled in at least 6 credit hours of information systems electives at the 3000 level or above, consent of supervising instructor, and consent of department chair. Students are employed in the field of information systems where they apply the knowledge and skills learned in the classroom. Professional development obtaining specialized work experience are primary goals. An information systems faculty member will monitor the student's program with the student providing a formal written report at the end of the project.

INFSYS 3898 Seminar in Information Systems: 1-3 semester hours
Prerequisites: To be determined each time course is offered and to include a minimum 2.0 overall GPA. This course is a selected special topic in the field of information systems. May be repeated for credit with different topics.

INFSYS 3899 Independent Study in Information Systems: 1-3 semester hours
Prerequisites: Minimum campus GPA of 2.0 and approval by the supervising professor and the Area Coordinator. Special individual study in information systems under the supervision of a full-time information systems faculty member.

INFSYS 4850 Information Systems Design: 3 semester hours
Prerequisites: INFSYS 3810, INFSYS 3816, INFSYS 3845 and a minimum campus GPA of 2.0. This course builds on the skills learned in INFSYS 3810. System design, implementation, and methods of systems installation and operation are presented. A system development project is required.

INFSYS 5800 Management Information Systems: 3 semester hours
Same as P P ADM 6800. This course provides an overview of the established and contemporary issues related to information systems within organizations. Topics include the practices and tools associated with topics such as the management of IS-based investment projects, the design and implementation of IS, the alignment of IS strategy with organizational strategy, information security and privacy, and gaining a competitive advantage through IS.

INFSYS 5890 Graduate Internship in Information Systems: 1-6 semester hours
Prerequisites: INFSYS 6840 or permission of instructor. The internship will be a supervised field experience in a US-based business/organization or a US-based international business/organization. Students will be employed off-campus for a 10-16 week period on projects directed by host organization supervisors in consultation with a UM-St. Louis faculty member. The project requires students to apply IS concepts to a real-world problem. The project does not duplicate, but builds upon material in the IS curriculum. A professional written report will be required.

INFSYS 5899 Individual Research in Information Systems: 1-3 semester hours
Prerequisites: Consent of instructor and graduate director. Special individual research topics in Information Systems under the guidance of a specific professor.

INFSYS 6805 Applications of Programming for Business Solutions: 3 semester hours
Prerequisite: Graduate standing. This course will enable students to design, implement, and debug object-oriented and data driven business applications in C#.NET. Students will learn application design choices, object-oriented design principles, event-driven programming, user interface programming, user interface controls, data binding and database access, exception handling, debugging and effective ways of working with C#.NET.

INFSYS 6806 Managerial Applications of Object-Oriented Technologies: 3 semester hours
Prerequisite: Graduate Standing. This course provides an introduction to object-oriented programming. Topics include object-oriented design principles and choices, encapsulation, inheritance, and event-driven programming. Hands-on labs during class sessions and assignments help students develop applied programming skills.
INFSYS 6807 Business Programming and File Systems: 3 semester hours
Prerequisites: Graduate standing. This course covers structured programming techniques for legacy business applications. Students will learn COBOL syntax, structure, design and best programming practices to create, maintain, debug, compile and execute COBOL programs.

INFSYS 6808 Advanced Object-Oriented Programming for Business: 3 semester hours
Prerequisite: INFSYS 6806. This course builds on skills learned in INFSYS 6806 and focuses on contemporary client-server development environments and tools. Topics include database integration, web applications, and web services. Students will be provided hands-on application development experiences during class and in assignments.

INFSYS 6828 Principles of Information Security: 3 semester hours
Prerequisites: Consent of Instructor. This course is a survey of the vast field of Information Security (InfoSec). It intersects both management and technical aspects of security as relevant to organizations, governments, individuals, and society. Topics covered include fundamental principles of InfoSec and cyber defense, the threat environment, management of InfoSec in organizations, technologies and tools in InfoSec, cryptology/cryptography, web application security, vulnerability management, and current issues. Hands-on labs expose students to basics of penetration testing, applications of cryptography, and vulnerability management. A graduate research paper is required. This course is open to all majors. Credit cannot be granted for both INFSYS 6828 and INFSYS 3848.

INFSYS 6832 Information Systems Strategy: 3 semester hours
Prerequisites: Graduate Standing. This course presents the management of computer-based information resources in the context of business organizations. Issues may include: management strategies and policies for improving organizational productivity, measurement, evaluation and acquisition of management information services, office automation, end-user computing, computer use in international environments, social and organizational perspectives and ethical implications. The course will be taught using cases.

INFSYS 6833 Decision Support Systems for Business Intelligence: 3 semester hours
Prerequisite: SCMA 5300. This class examines the applications of data and analytics (models) to support the needs of decision makers. Descriptive, predictive and prescriptive analytics tools are coupled with Big Data and well-designed user interfaces to provide the necessary tools. Topics such as how to construct the data warehouse, how to clean and store data in the appropriate form, how to construct and implement a useful visualization of data, and how to construct and support decision makers are included. DSS component design in response to decision making and business intelligence needs are discussed.

INFSYS 6836 Management of Data Networks and Security: 3 semester hours
Prerequisites: INFSYS 5800 (may be taken concurrently) or Consent of Instructor. This course focuses on the big-picture implications and challenges of data networking and network security within contemporary Information Technology environments. It covers fundamentals of networking and security implications of data networks with hands-on exercises. Topics include networking layers and standardization of functionality across layers, wired and wireless Local Area Networks (LANs) along with switching and physical layer technologies, Internetworking, supporting and supervisory protocols, application layer protocols, network design and management, and fundamentals of network security. Students will also learn about network protocol analyzers such as Wireshark, virtualization, networking in virtual environments, and how some common networked applications operate by utilizing the networking infrastructure. Credit cannot be granted for both INFSYS 6836 and INFSYS 3842.

INFSYS 6838 Business Processes: Design, Management and Integration: 3 semester hours
Prerequisite: INFSYS 6808. Business design methodologies are used to create new, or improve existing processes. Examples of business processes include: call centers, order-flow processing in financial services, manufacturing, hospital emergency services, and more. Special attention is paid to the role of information technology during the design process. Specific business process design methods we will cover are: SIPOC (supplier-input-process-output-customer), Process Flow Mapping, Simulation Modeling, Performance Scorecards, Quality Functional Deployment, Failure Mode and Effects Analysis, and Theory of Constraints. Case studies are used to illustrate the concepts and guest speakers will discuss their applications of the latest business process design methods and software.

INFSYS 6840 Information Systems Analysis: 3 semester hours
Prerequisite: INFSYS 6805 or INFSYS 6806. In this course, students will learn how to identify, evaluate, and document business systems using traditional and agile methodologies. This includes how to study systems’ ability to meet the business needs and information requirements of an organization, and defend alternatives that better meet needs. Students will conduct a systems analysis of an actual organization in project teams, including the identification of and defense of alternatives.

INFSYS 6845 Database Management Systems: 3 semester hours
Prerequisites: INFSYS 5800 and either INFSYS 6805 or INFSYS 6806. This course provides an introduction to the design and use of databases in meeting business information needs. Topics include database architecture, design, administration, and implementation. The concepts are studied with projects involving the use of a current database management system.
**INFSYS 6846 Global Sourcing and Automation of Business Services: 3 semester hours**
Same as INTL BUS 6846. Prerequisite: INFSYS 5800. Largely fostered by globalization, the Internet, processing standards, and software innovations, organizations aim to provide business services anytime, anywhere, and on any device. This course covers sourcing and automation topics to help managers deliver business services better, faster, cheaper and with good social impacts. Students will investigate sourcing options such as outsourcing, offshoring, shared services, captive centers, cloud sourcing, impact sourcing, prison sourcing, crowd sourcing, and rural sourcing. Students will investigate automation innovations such as robotic process automation, cognitive automation, and Blockchain. The course covers all types of business services, including information technology services, financial and accounting services, human resource services, call centers, procurement, real estate services, and legal services.

**INFSYS 6847 Project Management: 3 semester hours**
Prerequisite: INFSYS 5800. Effective project management ensures that a project is completed on time, within budget, and has high quality. The purpose of this class is to examine the task of project resource management with a focus on IT and services. It will cover conventional aspects of project management, such as the project evaluation, planning, roles, responsibilities, scheduling, and tracking. In addition, this class will examine risk management, change management, critical chain management, build vs. buy analysis, package vs. custom solutions, vendor qualification and selection, and the roles of certification in the process. The class will also cover the management of programs or a portfolio of IT projects.

**INFSYS 6848 Knowledge Management and Business Intelligence: 3 semester hours**
Prerequisite: INFSYS 5800 Knowledge management (KM) is the process of creating, and drawing value from, an organization’s intellectual assets. It deals with how to best leverage the organization’s knowledge internally as well as externally. The emphasis on knowledge management within business organizations has risen dramatically in the last few years, to some extent as a result of the rapid progress in information technology capabilities. The course covers the following topics: KM tools, technologies, and systems, including knowledge repositories, knowledge portals, and expert seeker systems, creating and sustaining a knowledge sharing culture, managing and measuring intellectual capital, managing knowledge in networked organizations, including interorganizational alliances and supply chains, aligning knowledge with business strategy, risks of knowledge loss and knowledge leakage, business intelligence, and social aspects of knowledge management.

**INFSYS 6849 Data Warehouse Design and Implementation: 3 semester hours**
Prerequisites: INFSYS 6845 or consent of instructor. Course will cover different design configurations for structuring and organizing data in a data warehouse. Formal methodologies for the development of data warehouses will also be discussed and implemented.

**INFSYS 6850 Information Systems Design: 3 semester hours**
Prerequisites: INFSYS 6840 and INFSYS 6845 This course builds upon the analysis techniques presented in INFSYS 6840. It requires the student, usually working in a group to design and implement a system in a real-world environment. Advanced design concepts are presented to support the students in their project work.

**INFSYS 6851 Practicum in Business Intelligence: 3 semester hours**
Prerequisites: INFSYS 6833, INFSYS 6849, and SCMA 6345. This course will provide the context for students to integrate, synthesize and apply their Business Intelligence skills in an actual business organization. Project work will be jointly supervised and coordinated by a faculty member and a supervisor in the relevant business organization.

**INFSYS 6858 Advanced Cybersecurity Concepts: 3 semester hours**
Prerequisites: INFSYS 6828. This course provides an in-depth examination of advanced principles of cybersecurity. A broad range of topics are covered, including penetration testing, formal verification of systems, formal models of information flow and protection, distributed system authentication, protocol design and attack, computer viruses and malware, as well as intrusion and anomaly detection models. Multi-level security architecture, active defenses, investigation and forensics, network firewalls, virtualization, anonymity and identity, mobile security, and database security models and mechanisms are also studied. The course content is largely influenced by the latest research in the field. Credit cannot be granted for both INFSYS 6858 and INFSYS 3858.

**INFSYS 6860 Data Integration: 3 semester hours**
Prerequisites: Consent of Instructor. This course discusses the theories and techniques for blending unstructured and structured data including Big Data and social media streams with relational databases, data warehouses, spreadsheets, and other sources of data. Using mini-cases and assignments, it provides hands-on experience in integrating data from diverse sources, screening and cleaning it, and producing descriptive and visual summaries in tables, graphs, maps, and text for business intelligence. Students will be introduced to tools that integrate data from different sources and provide input to dashboards for rich visualization and advanced analytics.

**INFSYS 6868 Software Assurance: 3 semester hours**
Prerequisites: INFSYS 6805 or INFSYS 6806 or Consent of Instructor. This course provides an overview of the vast field of software assurance. The goal is to make students aware of the fundamentals of the secure software lifecycle enabling them to apply principles of secure software development and management. The course also provides practical applications that allow the learners to experience the secure software lifecycle process by developing concrete artifacts. Credit cannot be granted for both INFSYS 6868 and INFSYS 3868.

**INFSYS 6878 Management of Transnational Information Systems: 3 semester hours**
Prerequisites: INFSYS 6828. This course provides students the necessary background knowledge and skills to develop and run a systematic information security management program that is in line with organizational strategy, structure, processes, and culture. Specifically, the course introduces governance, strategy, policies, implementation, operation, evaluation, and improvement of an organization's information security to achieve business objectives and be resilient to information security threats. Credit cannot be granted for both INFSYS 6878 and INFSYS 3878.

**INFSYS 6881 Management of Transnational Information Systems: 3 semester hours**
Same as INTL BUS 6881. Prerequisites: INFSYS 5800, INFSYS 6825 (may be taken concurrently). The course presents concepts of managing global information technology. Issues covered include: global information technology, systems development, electronic data interchange, cross-border data flows, and national and international information structures. Further topics may include information technology enabled economic development, global outsourcing of information systems services, and social, organizational and ethical implications.
INFSYS 6891 Seminar in Information Systems: 3 semester hours
Prerequisites: INFSYS 5800. Topics of current interest in management information systems. Topics may include international information systems, electronic commerce, decision support systems, information systems strategy, telecommunications, and information systems management.