Master of Information Systems Management (MISM)

Course requirements
Information Systems Management Curriculum

Overview

Complete both required courses:
- T81-527 Introduction to Big Data, Business Process Modeling & Data Management*
- T81-5502 Art and Science of Risk Management*

Complete two of the following technical courses:
- E81-530 Database Management Systems
- T81-507D Information Mgmt. & Enterprise Technology*
- T81-558 Applications of Deep Neural Networks
- T81-581B Perspectives on Innovation and Technology*

Complete two of the following management courses:
- T55-502S Strategic Management of Technology*
- T55-524A Executive Perspectives for Technical Professionals
- T81-517 Service Management
- T81-584 Public Speaking & Presentation Skills for Technical Professionals

Complete three of the following elective courses:
- B66-524 Negotiation
- E81-511 Artificial Intelligence
- E81-514 Data Mining
- T60-502 Financial Principles of the Company
- T81-560 Systematic View of Cyber Security & Information Assurance
- T81-575 Data Warehousing
- T81-576 Predictive Modeling
- T81-527 Business Continuity & Disaster Recovery Planning
- T81-5500 Enterprise Resource Planning (ERP)
- T81-5504 Foundations of Project Management

All students in the MISM program will be required to take the capstone course as their final course in the program.
- T81-585 Capstone Course

*These courses are required to earn a Graduate Certificate in Information Systems Management
**Introduction to Big Data, Business Process Modeling & Data Management**

**Total Units: 3.0**

This course is designed to introduce basic concepts of “Big Data” and the impact these technologies have on society and the enterprise. The course will describe various types of practical “Big Data” implementations, but will focus on the business value that such technologies may allow the enterprise, as well as the risks that can arise from managing the large volume of data that new technology allows. The course will cover a broad spectrum of data fundamental terms, definitions, historical perspectives, and current trends with a focus on big data as a business consideration in an ever changing world of technological advances and business needs. The course will introduce key big data concepts and terminology that will allow both the business leader and the technical engineer the ability to converse in terms relevant to both disciplines. This course is expected to raise the general awareness of business and technical professionals about the threats, risks, and control needs in the cyber-evolving world around them and provide a roadmap for big data implementations and projects in small and large enterprises.

**Art and Science of Risk Management**

**Total Units 3.0**

This course focuses on why many project managers miss requirements for schedule, budget or even both. The course concentrates on key Risk Management techniques practiced by leading Project and Program Managers and taught through fact filled lecture, case work and project execution as applied to information systems, engineering, financial, product/process and design projects/programs in today’s fast moving environment. Students will take away key value propositions including Risk Identification, Risk Quantification, Risk Monitoring, Risk Control and Risk Mitigation. This course will enable the student to address common Scope, Schedule, Quality and Cost risk events that occur on complex projects. Project Risk Management examines the types of risk, with a focus on understanding the process of risk identification, assessment, prevention, mitigation, and recovery; governance, auditing, and control of the confidentiality; integrity; and availability of data. Using common operational, strategic, tactical, and technological scenarios, the coursework provides a comprehensive approach to the challenges faced by managers where global data is readily available, risk is pervasive, regulations are ever-increasing, and the threat of disruption from potential crises is real.

**Database Management Systems**

**Total Units 3.0**

A study of data models and the database management systems that support these data models. The design theory for databases is developed and various tools are utilized to apply the theory. General query languages are studied and techniques for query optimization are investigated. Integrity and security requirements are studied in the context of concurrent operations on a database, where the database may be distributed over one or more locations. The unique requirements for engineering design databases, image databases, and long transaction systems are analyzed.

**Information Mgmt. and Enterprise Transformation**

**Total Units 3.0**

The modern enterprise relies heavily on information management. As enterprises transform to keep pace with business realities such as globalization, mergers/acquisitions, and proliferation of new business models, management needs to reconsider technology infrastructures, social infrastructures, re-engineering business processes, outsourcing, and measuring/managing technology knowledge. The roles of CIOs and IT professionals, power teams, and leadership issues concerning change will be covered. Prereq: Graduate Standing Only.

**Applications of Deep Neural Networks**

**Total Units 3.0**

Deep learning is a group of exciting new technologies for neural networks. By using a combination of advanced training techniques neural network architectural components, it is now possible to train neural networks of much greater complexity. This course will introduce the student to deep belief neural networks, regularization units (ReLU), convolution neural networks and recurrent neural networks. High performance computing (HPC) aspects will demonstrate how deep learning can be leveraged both on graphical processing units (GPUs), as well as grids. Deep learning allows a model to learn hierarchies of information in a way that is similar to the function of the human brain. Focus will be primarily upon the application of deep learning, with some introduction to the mathematical foundations of deep learning. Students will use the Python programming language to architect a deep learning model for several of real-world data sets and interpret the results of these networks.
Perspectives on Innovation and Technology

**Total Units: 3.0**
Understanding the role that new technologies can play in achieving the strategic vision and thus shareholder value of the firm will be the focus of this course. This includes reviewing appropriate ways of judging a technology and whether a re-positioned technology can drive business value. Students will participate in a process of discovery and judgment rationalization that will lead to understanding how to bring together the technical and commercial worlds in a profitable way. A discussion of the key concepts that it would take to distinguish between activities and outcomes. How do you distinguish between discoveries and technologies add value? Technological innovations (outcomes) are normally the result of product, process, market development and administrative capabilities.

**Complete two of the following management courses:**

**Strategic Management of Technology**

**Total Units: 3.0**
Analytical methods for strategic management are reviewed. Technology strategy is linked to the strategic plan for the organization, and methods to accomplish this linkage are developed. Factors that characterize and encourage innovation are discussed. A process for managing and integrating new technology into the strategic process is developed. Throughout the course, cases are used to analyze and demonstrate the several elements of strategic management of technology. Prerequisite: graduate standing

**Executive Perspectives for Technical Professionals**

**Total Units: 3.0**
Executive leadership is fundamentally dealing with human emotions and relationships. Technical and other professionals are challenged in this course to think from an executive leadership position. Being able to assess and lead other people requires balancing existing realities with new visions and moving people to these new visions. Issues addressing executive leadership include: Executive competencies, consulting in executive environments, re-initiating strategic moves, leadership development, succession planning, and enterprise leadership political skills. These topics are explored through lectures, case studies, and in-class discussions with industry executives.

Service Management

**Total Units: 3.0**
This course focuses on the IT Service Lifecycle and its value to the business. This in-depth study of Service Strategy, Service Design, Service Transition, and Service Operations will provide the student with an understanding of the 26 IT Infrastructure Library (ITIL) processes. Through the application of continuous service improvement, students will understand the IT service lifecycle and will also be able to assess the effectiveness of processes and services. This course includes case studies, lectures, and group activities to enhance the textbook material.

**Public Speaking & Presentation Skills for Technical Professionals**

**Total Units: 3.0**
More and more, major corporations require their technical staff to have the skills to communicate to other employees and to be able to deliver compelling and succinct presentations. One of the goals of the MIS and MCSM programs is to produce great analytical thinkers. The goal of this course is to create analytical thinkers who are great communicators and can deliver clear, concise, creative and perhaps even entertaining presentations - within a technical setting. In order to bring out their more expressive side, students will learn how to overcome the fear of public speaking and truly communicate with an audience of any size; study techniques actors learn to perfect their ability to think quickly on their feet, including improvisation and storytelling; and learn the keys to great presentations both graphically and auditorially-including advanced PowerPoint® skills. Students will be assigned and graded on presentations delivered on a myriad of topics culminating in a final presentation in the student's core area of study, which will be delivered to a panel of business professionals. To put it succinctly: this is the preparation course for your TED® talk.

**Electives**

**Complete three of the following elective courses:**

Negotiation

**Total Units: 3.0**
Managers spend the majority of their time negotiating - from negotiating schedules and vacation time to negotiating resource allocations to negotiating mergers and major policy decisions and their implementation. Skillful negotiation is a critical component of the tool box of the successful manager. The purpose of this course is to improve students’ abilities to diagnose conflict situations, to analyze, plan, and conduct negotiations. The course material addresses negotiation as an effective means for implementing decisions and strategies and resolving conflict in a variety of settings. Course format will involve simulated negotiation and experiential exercises, cases, discussion, and lecture. Students
will be evaluated on the basis of case analysis, negotiating performance, and a final project. Students may not take both this course and OB 561 for credit. This course covers topics in greater depth than the shorter OB 561 course, offers more opportunities for hands-on practice, learning, and feedback, and also covers a wider range of additional topics.

**Artificial Intelligence**

**Total Units: 3.0**

The discipline of artificial intelligence (AI) is concerned with building systems that think and act like humans or rationally on some absolute scale. This course is an introduction to the field, with special emphasis on sound modern methods. The topics include knowledge representation, problem solving via search, game playing, logical and probabilistic reasoning, planning, dynamic programming, and reinforcement learning. Programming exercises concretize the key methods. The course targets graduate students and advanced undergraduates. Evaluation is based on written and programming assignments, a midterm exam and a final exam.

**Data Mining**

**Total Units: 3.0**

With the vast advancement in science and technology, data acquisition in large quantities are routinely done in many fields. Examples of large data include various types of data on the internet, high-throughput sequencing data in biology and medicine, extraterrestrial data from telescopes in astronomy, and images from surveillance camera in security. Mining a large amount of data through data mining has become an effective means to extracting knowledge from data. This course introduces the basic concepts and methods for data mining and provides hands-on experience for processing, analyzing and modeling structured and unstructured data. Homework problems, examines and programming assignments will be administrated throughout the course to enhance the learning.

**Financial Principles of the Company**

**Total Units: 3.0**

The course is designed to a) provide incoming program enrollees with little or no finance and accounting experience or background with a solid basic understanding of financial accounting concepts with an emphasis on the managerial applications of financial data, b) prepare those incoming students for the more advanced, discipline specific courses offered later in the program and, c) give those students a grounding in financial concepts that the student can utilize as they advance to higher and more responsible leadership positions post-graduation. The course is divided into three phases. The first consists of introducing and stressing basic financial concepts, rules, and principles. The second phase consists of leveraging that basic skill set to perform and evaluate analysis in the organization. The last phase will be case study driven and will challenge the student to take the lessons of the first two phases, combine that information with already existing experience and background, and develop a business correction plan for an ailing organization.

**Systematic View of Cyber Security & Information Assurance**

**Total Units: 3.0**

Information security is paramount to the health of a successful enterprise. Learn what it takes to manage and operate an information security program in an enterprise. The focus is on areas such as risk assessment, risk management, incident handling and business continuity planning. Learn the vocabulary, vernacular and terminology used in the information security space. Learn what keeps Chief Security Officers, their teams and the business clients they serve “awake at night”, and what you can do, as an information security professional to protect your clients.

**Data Warehousing**

**Total Units: 3.0**

This course will introduce you to the major activities involved in data warehousing and its application to a business. The class will concentrate on topics such as: requirements gathering for data warehousing, business constraints, data warehouse technologies and architectures, dimensional model design, entity relationship model design, physical database design for data warehousing, extracting, transforming, and loading strategies, introduction to business intelligence and reporting, expansion and support of a data warehouse. Once the basic principles have been established, the remainder of the class will be built around a group data warehouse project. The project will begin with your group gathering requirements and developing a data warehouse design. Once the design is complete you will build a prototype data warehouse containing the necessary structures within your database and populating them with source data. This will require you to develop the table definitions, extract/transformation/load (ETL) logic, and example report definitions. We intend this class to be a hands-on example of a simple data warehouse implementation. Focus Areas and Skills Obtained After Completion of the Course: Gather Requirements for Data Warehousing, Explain Data Warehouse Technologies and Architecture, Understand the Advantages and Disadvantages of Both Dimensional and ER Modeling for Data Warehousing, Identify Data Sources, Design a Physical Model for Data Warehousing, Comprehend Extract, Transform and Load Strategies, Design and Develop Business reports and Business Considerations for Expanding and Supporting a Data Warehouse.
Predictive Modeling

**Total Units: 3.0**
This course introduces statistical models as they are used in predictive analytics. The course reviews traditional linear and generalized linear models, including multiple regression and logistic regression. It addresses issues of model specification and model selection, as well as best practices in developing models for management. The course also demonstrates the application of multivariate methods in predictive analytics. Drawing upon examples from economics and business, this course also provides an in-depth review of modeling practice. Special attention is paid to linear predictor and error structure specification for time series models.

Business Continuity & Disaster Recovery Planning

**Total Units: 3.0**
This comprehensive course provides up-to-date assessments and understanding on issues that will affect you and your company. Issues such as earthquakes, hurricanes, acts of terrorism, communication, cyber security and news media events will be discussed by an expert who has led disaster recovery efforts through most of these events. You will have the opportunity to interact with experts in these areas and gain practical knowledge about how to respond and deal with large scale events affecting the enterprise. By the end of this course, the student will have a thorough comprehension of the tools, knowledge and understanding necessary to assess, benchmark and develop a wide-ranging disaster recovery and business continuity program.

Enterprise Resource Planning (ERP)

**Total Units: 3.0**
The skills and knowledge for managing and implementing ERP systems and projects are in high-demand by companies today. Attention to skills and knowledge needed for roles as ERP business analysts, ERP configuration specialists, and consultants will be provided. The course introduces participants 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. The course focuses attention towards learning and understanding the primary business functions that all companies utilize and the interrelationships among these modules. During the course, each student will complete exercises to construct a functioning company operating in an integrated SAP environment. The exercises provide a guide through the concepts and creation of applications supporting the business functions of the company.

Foundations of Project Management

**Total Units: 3.0**
A practical orientation for using what is known about organizations and how to apply this knowledge to managing projects. Review of the project management paradigm, the basic ingredients of a project, critical stakeholders and roles, and the normal project life cycle will be provided. An introduction to the project management mastery model is covered along with explanations for ways to integrate current and future knowledge into the model. How project approaches should differ by how to segment the problem space - monolithic, incremental, or evolutionary.

All students in the MISM program will be required to take the Capstone course as their final course in the program

Capstone Course

**Total Units: 3.0**
The capstone project is a culmination of a student’s prior coursework and is taken toward the end of their program. It gives the student the opportunity to utilize the hard-earned knowledge and skills they have developed as a MISM student in a real-world setting. The project gives them a chance to apply business judgment and cyber security models to current and emerging opportunities as they confront, create and present a comprehensive cyber security plan to a panel of cyber security industry experts. MISM students can choose to apply their efforts for their capstone experience to the strategic benefit of their current companies, while others may desire to display more of a holistic focus to the capstone, taking advantage of the project to understand different industry issues.

If you have questions, contact us at:
Washington University
School of Engineering & Applied Science
Lopata Hall, CB 1220, 1 Brookings Drive, St. Louis, MO, 63130
Phone: (314) 935-5455, Fax: (314) 935-5449
engineeringgradadmissions@wustl.edu