



**School of Management**  
**Business Analytics and Information System Department**

**Master of Science in information Systems - MSIS**  
**Proposed Maintenance of List of Courses & Learning Outcome**

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## Program Overview

Graduates of the MSIS program will be prepared to provide leadership in the Information Systems field. It is a professional degree that:

- Integrates information and organizational cultures; focusing on current and emerging concepts from both technical and managerial viewpoints.
- Addresses the need of organizations to integrate disparate internal systems in order to create effective communication channels with external parties such as suppliers and customers.
- Promotes the ability to use information technology to foster sound financial systems, to create more effective organizational structures, and to better manage an organization's human capital.
- Investigates how policy and strategic decisions are affected by information systems and how technology is transforming organizations.
- Improves people, business, and team skills, while emphasizing a customer service orientation, ethics and professionalism.

## Proposed MSIS Program Maintenance

In late 2015, we started interviewing program alumni, leaders in industry, and USF staff & instructors, to assess how well the MSIS program was meeting the needs of students. From this research it was clear that we needed to upgrade the program to be more in tune with students' learning objectives and Silicon Valley's high tech employers, all while also meeting requirements within the University. After the interview phase we presented our findings to Dean Davis and to the Business Analytics & Information Systems department, receiving approval from both.

The MSIS program was originally constituted within the College of Professional Studies, and later moved to the graduate School of Management where it now resides. Since the program's inception, many changes have been implemented within the University, but very few have been made to the MSIS program itself. It is now time to upgrade the program to meet the new demands of the University; better meet the learning objectives of future students; and, to open enrollment to the F-1 visa community.

## Updates

### Meet Minimum Enrollment Requirements

The most pressing need for change comes from the Office of the Provost, which now requires that each class section have a minimum of 15 enrolled students before the class can be launched. Under the current MSIS design, students have an option late in the program to take three courses that focus on either computer security or biotechnology. When that occurs, class sizes decrease from the normal 15 to 18 students down to as few as three to five students. While this has been allowed by the Provost's office in the past it will not be in the future. For

this reason, we propose that the optional concentrations be removed and that all students be required to take twelve specified core courses for graduation.

### **Move to Open Enrollment**

Another structural modification is recommended to better integrate into the School of Management (SOM) at large, and provide students with greater flexibility. We propose that we move from the current cohort model to an open enrollment model. This will allow students to better align their academic pursuits with their personal lives. As such they may choose to either spread out the course work or accelerate their completion of the program. It will also better align with most other courses offered within SOM. Though we would move to open enrollment, we suggest keeping the seven-week course length and offering two courses in serial per semester.

### **Access for International Students**

Under the current cohort model, students are considered part-time, thus precluding our acceptance of F-1 visa students. Each year we turn away 15 to 20 non-U.S. applicants who have formally applied to the program because they cannot meet the visa requirements. Naturally, Admissions preemptively counsels interested foreign citizens not to apply, as the program does not comply with the Department of Homeland Security's F-1 visa regulations. If we can meet DHS's F-1 visa requirements, we could easily double the number of students in the program. The proposed open enrollment would allow student to attend full-time if they so choose. This would bring the program in compliance with DHS regulations. The number of enrolled international students will likely increase, after the University starts actively advertising the program outside the U.S.

The international students will have the option of an extra course that will allow them to work in the American business community which is a strong draw. This Curricular Practical Training (CPT) course is new and is called Information Services Field Consulting.

### **Four New Courses**

Many of the current courses will be retained, but will be updated to include current technologies and processes. Several existing courses are being retired and replaced with three offerings that address the new technologies that have surged in the business community. A fourth course, mentioned above, is being added specifically for international students, but will be available to domestic students as well. The new courses are:

- Social Media as a Tool
- Cloud Services & Solutions
- Data Architecture & Management
- Information Services Field Consulting [CPT course for international students]

### **Incentivizing with a Salesforce Certification Path**

Salesforce is the #1 supplier of On-Demand CRM in the world. They are also headquartered just a few blocks from out 101 Howard campus. Father President and Dean Davis have indicated

their belief that building a rich partnership with Salesforce is a priority for the university and the School of Management. We are adding the Data Architecture & Management course to provide architecture skills in general, and to prepare student for Salesforce certification as a 'Data Architecture and Management Designer'. Students are encouraged, but not required, to seek this certification.

### **Increased Student Flexibility**

Finally, the open-enrollment model offers the flexibility of following a less demanding schedule of courses, if a student so chooses, while completing the program over a longer period of time. Given that all courses are offered at least every other semester, and can be taken in any order, students have the flexibility to complete the program on a schedule that is more flexible than previously. [This paragraph had previously stated that Analysis, Modeling & Design was a prerequisite for the Data Systems course, that is no longer the case.]

**Note:** Each of the courses below are 3 credits each except for the **Information Services Field Consulting** course.

## Updated Suite of Courses

### 1. Analysis, Modeling and Design

Studies the systems development life cycle, analysis and design techniques, information systems planning and projects identification and selection, requirements collection structuring, process modeling, data modeling, interface design and data management, system implementation and operation, system maintenance, and change management implications of systems. The course utilizes current methods and tools, such as rapid application development, prototyping, and visual development.

#### Learning Outcomes

At the completion of the course students will be able to understand and have experiential skills in:

- The Work of the Information Systems Analyst
- How to Investigate and Model System Requirements
- Various Approaches to Requirements Specification
- How to Evaluate Alternatives for Requirements, Environment, and Implementation
- The Elements of Systems Design
- Use Case Realizations
- Specifying Requirements for:
  - Designing Essential Data and Its Relationships
  - Designing User Interfaces
  - Designing System Interfaces, Controls and Security
- Developing a Plan to Make the System Operational
- The Preparation of a Professional Systems Design Document – both in appearance and content - and an Attendant Slide Presentation to sell the design
- The role of Analyst as a Project Manager

### 2. Data Systems

Presents the concepts, principles, issues, and techniques for managing organizational data resources. Explores both legacy as well as evolving data systems and platforms given the emergence of high-volume, high-velocity, and high-variety requirements of modern data management. The emphasis is on developing a thorough understanding of the principles of the data lifecycle, data modeling, the conversion of data models into working data processes and systems, as well as comprehension of the choices the associated with currently available data platform technologies.

#### Learning Outcomes

At the completion of the course, students will be able to

- Have the theoretical and practical skills for building databases and database applications.
- Have an understanding of the design and development processes.

- Be able to use Entity-Relationship Diagrams as a tool to assist in logical database design, be able to design logical databases in third normal form
- Be able to identify current issues in the uses of database management systems
- Be able to identify issues in physical database implementation
- Gain familiarity with industrial strength database management systems.

### 3. Data Architecture & Management

Data architecture is the creation of the rules & structure of an enterprise-wide computing system. It consists of models, policies, rules and standards that govern which data are collected, and how they are stored, arranged, integrated, and put to use in data systems and in organizations. This course will help students prepare for the Salesforce 'Data Architecture and Management Designer' certificate.

#### Learning Outcomes:

- Define a system's logical model
- Identify/define the enterprise data strategy
- Define enterprise-wide data standards
- Design the physical data architecture
- Define an archive & retention strategy
- Define a reporting strategy
- Define enterprise object classification and tiering strategy

### 4. Managing Projects and Change

Examines the managing of projects within an organizational context including the processes related to initiating, planning, executing, controlling, reporting and closing a project. Project integration, scope, time, cost, quality control, and risk management, as well as managing the changes in organizations resulting from introducing or revising information systems are studied. Students will form into teams and manage a project with a real client associated with a community organization as part of the university's commitment to service learning.

#### Learning Outcomes

At the completion of the course, students will be able to

- Identify the fundamentals of successful project and program management,
- Scope a project for successful outcomes,
- Build a project team and to work effectively,
- Prepare project budgets and timelines,
- Negotiate deliverables and contractual arrangements with the recipients of the final project,
- Describe and model the process and workflows using both traditional and object-oriented techniques,
- Understand the effects of change and how change can affect an organization.



## 5. Social Media as a Tool

Social media is a broad term used to describe a host of online tools that propel social interaction. While Facebook, LinkedIn, YouTube and Twitter are used most frequently, the world of social media encompasses so much more. This course will provide a unique opportunity to understand how social media is fundamentally changing the way companies operate. Students will examine and assess the roles of the consumer, online communities, crowd sourcing, and the impact of new technologies and changing lifestyles. In the process, they will identify market leaders & key tools, and learn how to effectively integrate them into their business environment.

### Learning Outcomes

At the completion of the course, students will be able to

- Understand the difference between social media platforms, including functionality, target audience, and intended use.
- Understand the business benefits associated with the social media platforms
- Understand how to integrate social media into existing marketing.
- Create a social media campaign, including optimal content and frequency.
- Assess the role of branding, social advertising and other communications in achieving behavioral change.

## 6. IT Policy, Strategy and Economics

Examines the top management perspective for aligning competitive strategy, core competencies, and information systems; the development and implementation of policies and plans to achieve organizational goals; defining the systems that support the operational, administrative, and strategic needs of the organization, its business units, and individual employees. It also provides an overview of modern economic and financial theories relevant to understanding the costs, benefits, and processes by which proposed or current information systems can be evaluated.

### Learning Outcomes

By studying information and communication technologies (ICT) policy and strategy, students will have the opportunity to expand their ability to:

- Understand how processes are configured to run organizations, and the relationships with legacy systems and other functional applications.
- Design an application architecture that provides the information needed for decision making and knowledge management
- See how ICT enables new organizational forms
- Organize and manage information technology as a functional unit
- Assess the impact of emerging technologies
- Demonstrate the value of ICT
- Identify the characteristics of successful ICT organizations

## 7. Information Security

Studies contemporary issues of information security, including effective information security policies, risk assessment factors, internal application security, relevant information security models, intranet vs. extranet security, firewalls and internet security, response to breaches of security, and operating a secure organizational network. Included also are hands-on analyses of information system vulnerabilities, techniques for exploiting such weaknesses, as well as the countermeasures for addressing information security flaws.

### Learning Outcomes

At the completion of the course, students will be able to:

- Fully explain the defining concepts that provide the building blocks for a viable Information Security Architecture.
- Understand how a distributed networking environment introduces additional security challenges in the form of communications protocol vulnerabilities, and be able to prepare an organization to meet the challenges of new vulnerabilities as they become known.
- Understand how to employ and manage advanced cryptography, access controls, distributed authentication, TCP/IP security, firewalls, Virtual Private Networks, intrusion detection/prevention systems, and wireless security.
- Define computer security policy and the attendant procedures that will competently protect data confidential, data integrity, and data availability.
- Describe the current trust issues encountered when engaged in eCommerce and be able to describe, define, and develop appropriate organizational procedures that will insure appropriate hardware/software configuration models that best support a viable eCommerce environment.
- Understand how computers may be used to enforce security policies.
- Be able to ethically address contemporary issues dealing with identity management, digital rights management, and data privacy.
- Define a Trusted System and be familiar with the design underpinnings that shape our current notion of what a Trusted System should be.

## 8. Communications and Networking

Examines telecommunication fundamentals, including data, voice, image, and video. The concepts, models, architectures, protocols, standards, and security for the design, implementation, and management of digital networks are studied, as well as local and wide networks, transmission and switching efficiency, and regulatory and technical environments. Topics include security, e-commerce, web sites, and middleware.

### Learning Outcomes

At the completion of the course, students will be able to

- Apply his or her learning from infrastructure terminologies, theories and concepts to solve network problems.

- Describe and differentiate various design techniques use in private and public infrastructure to support voice, data and video services and applications.
- Demonstrate his or her ability to apply their learning to examine real-world design criteria and parameters used in PAN, LAN, MAN, WAN, GAN and converged networks.
- Demonstrate an ability to provide thoughtful analysis in areas of transmission engineering, planning and implementation requirements.

## 9. Warehousing Knowledge Discovery

Modern technology has the means of collecting every minute detail of an organization's business activity and customer interaction. To turn raw data into useful information and knowledge requires a judicious approach to extracting, cleansing, and aggregating data so that it can be used to support strategic decision making (e.g. forecasting and trend analysis, performance monitoring, etc.). Further, systems that handle the volume, variety, and velocity of such data is evolving quickly. This course endeavors to do so by extending the concepts introduced in the Database course and examines the various business intelligence and analytics techniques applied to large data sets.

### Learning Outcomes

At the completion of the course, students will be able to

- Understand the difference between databases and data warehouses – transactional databases (OLTP), online analytical processing (OLAP), and data mining/machine learning.
- Understand the difference between traditional relational data warehouses, NoSQL databases, and platforms that currently support large-scale data mining.
- Understand the opportunity data analysis and decision modeling can create to not only support strategic and operational decisions, but to develop entirely new business opportunities.
- Be able to decide what data to collect and how to efficiently organize and archive it for future analysis.
- Understand different data analysis techniques (statistical, machine learning, supervised and unsupervised learning, regression, cluster analysis, etc.).
- Be able to select and apply the appropriate data analysis method for specific problems.
- Understand the limitations of data analysis.

## 10. eCommerce Development & Implementation

This course provides a comprehensive overview of the organizational structures and the technologies that support eCommerce. Topics covered include, eBusiness strategy, business models, governance structures, electronic markets, and eBusiness technological infrastructure. Students will form into teams and create an on-line eBusiness with all the associated infrastructure.

## Learning Outcomes

At the completion of the course, students will be able to

- Understand the historical development of e-Business
- Gain a broad understanding of the economic opportunities e-Business can create vis-à-vis a brick and mortar business environment
- Gain an understanding of difference between e-Business and e-Commerce
- Understand the barriers for conducting e-Business and how to overcome them
- Learn how e-Business technology is used to match newly created business models and then drive the development of technology to achieve success. Your project will allow you to explore e-Business capabilities and cost in today's marketplace that are applicable for small to medium sized businesses.
- Gain a broad understanding of the business concerns and requirements for bringing an existing business into the e-Business environment
- Understand at a business level some key select security and reliability requirements for e-Business, and the technologies to meet these requirements

## 11. Cloud Services & Solutions

This course provides an overview of the concepts and design principles behind existing cloud solutions. Topics include large scale data processing, overview of virtualized commercial cloud models, system virtualization, hypervisors and virtualized platforms. Design of cloud storage systems such as key-value stores and geographically distributed storage systems. Introduction to security and privacy issues in cloud computing, issues of data and execution privacy in modern commercial cloud services.

## Learning Outcomes

At the completion of the course, students will be able to:

- Describe technologies involved with data storage onto computing media.
- Analyze a corporate storage environment.
- Design proper storage strategies for the datacenter.
- Implement data storage solutions that utilize necessary security and access philosophies.
- Utilize tools to manage storage area networks and intelligent storage arrays.
- Implement server virtualization for use in varying sized networks.
- Manage the movement of virtual servers across physical servers and storage.
- Describe the various cloud implementation philosophies across physical servers and storage.
- Analyze best cloud solution (private/public/hybrid) for systems and applications.

## 12. Capstone Project

This course provides a broad survey of the individual, organizational, and cultural impact of information technology, in order to stimulate thoughtful reflection and debate upon the social issues provoked by current and projected uses of information technology. As part of this course, students will complete a capstone project.

### Learning Outcomes

At the completion of the course, students will be able to understand and have experiential skills in:

- A complement of common ethical frameworks
- Building and articulating a personal ethical framework and decision-making process
- Identifying ethical issues in the workplace and in society at large as they relate to Information Systems issues – locally, nationally and globally
- Understanding that there are multiple ethical solutions, and that others may have a different ethical framework
- Considering technology's positive and negative effects
- Developing a professional code in the Information Systems field based upon their personal values and understanding of the nature of technology

### Elective

International students will have the option of an extra course that will allow them to work in the American business community which is a strong draw. This Curricular Practical Training (CPT) course is new and is called Information Services Field Consulting. This will be in addition to the twelve required courses in the program.

## 13. Information Services Field Consulting (1 to 3 credits)

Students will work with a local business as a paid intern or temporary employee. The job must be directly related to studies within the Information Systems graduate program. The student must be registered full-time (unless it is their final semester of study), and must have a GPA of at least 3.0. Employment must be coordinated through International Student and Scholar Services, the employer & the student's academic advisor.

### Learning Outcomes

At the completion of the course, students will be able to:

- Comprehend and apply the foundational practices to successful consulting: contracting, client management, diagnosis/discovery, ideation and client feedback looping
- Understand both the similarities and differences between change and strategic consulting.
- Engage in concrete experiences (seeing/doing) with reflective observation and active experimentation
- Learn to develop a value proposition