



We Want Great Things for You

## COMPUTER AND INFORMATION SYSTEMS

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The Master of Science Degree in Computer and Information Systems produces effective leaders for advanced technology organizations. It offers the most up-to-date, industry based, knowledge of best practices in IT process development, leadership and program management. It provides seamlessly integrated strategic understanding of the correct way to manage lifecycle and information assurance processes.

Graduates will be able to interact and function effectively in a multi-national, multi-tiered project environment. They will be among the first people capable of bringing coherent understanding and direction to an industry that no longer functions within the limits of borders, or cultures. In addition, they will be able to ensure that their organizations will be able to compete successfully within this new paradigm.

Specific knowledge areas include: IT portfolio and project management, system requirements elicitation and specification, comprehensive program construction concepts, assurance and business alignment processes and information assurance, audit and control. Upon graduation students will be able to create and oversee productive and continuously improving management control infrastructures for large, complex and diverse businesses.

### Admissions Requirements

Admission decisions are based on an undergraduate GPA of 2.70, undergraduate major, work experience.

### Degree Requirements

A student must complete 30 credit hours, which comprise of five core courses and five electives.

### Pre-Core

NOTE: students who do not have programming experience must take the following course (which will not count towards the degree requirement):

[CIS 5010 Introduction to Information Systems](#)

### Core Courses

[CIS 5100 Object Orientation](#)

[CIS 5200 Specification and Design](#) \*

[CIS 5300 Quality Assurance](#) \*

[CIS 5400 Lifecycle Process Management](#) \*

[CIS 5500 Practicum](#)

### Elective Courses (Must pick 5 courses)

[CIS 5020 Enterprise Systems Programming](#)

[CIS 5050 Project Management](#) \*

[CIS 5250 Software Construction](#)

[CIS 5350 Metrics and Models for Software Management](#)

[CIS 5430 Lifecycle Process Improvement](#)

[CIS 5530 Human Factors in IT](#)

[CIS 5540 Post-Release Management](#) \*

[CIS 5550 Database Design](#) \*

[CIS 5570 Networks](#) \*

[CIS 5580 System Forensics](#)

[CIS 5590 Network Security](#) \*

[CIS 5600 National Security Studies](#) \*

[CIS 5650 Information Ethics](#) \*

[CIS 5660 Access Technologies](#)

[CIS 5700 Information Assurance](#)

[CIS 5750 Information Security Management](#)

[CIS 5790 Assurance Processes](#)

[CIS 5800 Advanced Topics](#) \*

[CIS 5820 IT Portfolio Leadership](#)

[CIS 5840 IT Performance Leadership](#)

[CIS 5890 International Software Management](#)

[CIS 5900 Lead Assessor Certification](#) \*

[CIS 5910 Audit](#) \*

[CIS 5950 Directed Research](#)

[CIS 5990 Master's Thesis](#)

[MBA 5200 Decision Analysis](#)

[MBA 5260 Information Systems and Technology](#)

[MBA 5620 Entrepreneurship](#)

**NOTE:** Courses with an asterisk denote the CNSS Certificate.



**For further information, please write, call or e-mail:**

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**Overall Course Descriptions**

**CIS 5010 Introduction to Information Systems 3 cr.**  
 This course provides fundamental professional skills for students who have no background in IT. The students will be able to specify, design, code and test software programs. Other topics include the norms and common practices of the profession as well as methodologies for design and coding of a typical business application.

**CIS 5020 Enterprise Systems Programming 3 cr.**  
 This course provides the basic skills and concepts for implementing and coding enterprise resource planning (ERP) systems. Topics include coverage of the basic concepts of ABAP/4 programming for the SAP R/3 system, the R/3 development environment ABAP/4 data handling and control statements, internal table formulation, modularization events and subroutines and the SAP functional modules.

**CIS 5050 Project Management 3 cr.**  
 Qualifies for CNSS Certification. Project management methods, models, software tools and standards for planning, scheduling, costing and control of software and information systems related projects, teambuilding and organizational issues. Course is based on the PMBOK and fulfills all of the PMI educational requirements.

**CIS 5100 Object Orientation 3 cr.**  
*(Prerequisite: Completion of pre-core requirements.)*  
 Focuses on abstraction and object based modeling. Students will develop and design programs using the UDL and an object based programming language. The student of this course will have the ability to conceptualize and clearly communicate concrete models of abstract structures.

**CIS 5200 Specification and Design 3 cr.**  
*(Prerequisite: Completion of pre-core requirements.)*  
 Qualifies for CNSS Certification. Concentrates on requirements specification and development of a Software Requirements Specification (SRS). Emphasis is on formal requirements specification approaches, methods and standards.

**CIS 5250 Software Construction 3 cr.**  
*(Prerequisite: Completion of pre-core requirements.)*  
 This course presents the fundamental methodologies employed in software engineering construction including all of the underlying elements of system programming. In addition it integrates that perspective into practical approaches to embedded work. The student will understand how to optimize operating and application system functioning and functional interfaces, formal methods for software construction, alternative methods for software construction including their advantages/disadvantages, software unit and integration testing approaches (strengths and weaknesses) and modeling notation.

**CIS 5300 Quality Assurance 3 cr.**  
*(Prerequisite: Completion of pre-core requirements and CIS 5200.)*  
 Qualifies for CNSS certification. Management of a quality system in software production. SQA Standards (ISO, IEEE) and best practices (CMM, SPICE.) Comprehensive coverage of Unit, Module, System, and Acceptance Testint. Principles, methods, models, standards and software tools used in the process of testing.

**CIS 5350 Metrics and Models for Software Management 3 cr.**  
 The fundamentals and applications of metrics and models for quality management are examined in this course. This includes all of the background necessary to establish a quality metric and improvement program.

**CIS 5400 Lifecycle Process Management 3 cr.**  
*(Prerequisite: CIS 5200 or permission of instructor.)*  
 Qualifies for CNSS Certification. Principles and practices of IT lifecycle process management. Includes software lifecycle and process engineering, change management, standards, metrics and models, software maturity/capability and assessment. Tools for managing integrated software environments. The student will be able to organize, plan and lead software process improvement and IT strategic alignment projects. Student will have a complete understanding of the IEEE 12207, CMM, CMMI, ISO 15504 (SPICE) and the COBIT models.

**CIS 5430 Lifecycle Process Improvement 3 cr.**  
 This course presents best practice lifecycle process improvement models at three levels: Organizational, Team and Personal. Students will learn about standard process improvement approaches at the organizational level by

studying the Capability Maturity Model (CMM). The student will understand the requirements of each of the key process areas, as well as the general aspects of their implementation. At the Team level students will examine the application of the Team Software Process (TSP). They will discover what should be done in order to establish robust and disciplined team practices. At the personal level students will learn the Personal Software Process (PSP).

**CIS 5500 Practicum 3 cr.**

*(Prerequisite: Completion of the first four required courses in the core.)*

This course provides end-to-end experience in information technology work. That includes direct, hands-on experience in all aspects of project set-up and planning, specification and design, implementation, unit, integration and system testing and post-release management. In addition to the practical experience the student will be exposed to all aspects of IT culture including the range of expectations and work practices.

**CIS 5530 Human Factors in IT 3 cr.**

The techniques for development of optimum processes and applications, with emphasis on human factors. Topics include best practices for design and implementation of interfaces for applications and managing an integrated development environment. The role of conceptual models and ergonomic factors, the importance of human factors for consistent GUIs for human computer interaction, usability testing and integration of components are investigated.

**CIS 5540 Post-Release Management 3 cr.**

*(Prerequisite: CIS 5200 or permission of instructor.)*

Qualifies for CNSS Certification. This course provides a defined and consistent set of methodologies and processes for the ninety percent of the software system's lifecycle that follows its development and release. It focuses on configuration management and reengineering of legacy programs as well as the systematic documentation of programs. Examples will be provided using the COBOL language. Standards, methods, models and tools for software maintenance will be covered as well as the preparation of software maintenance plans.

**CIS 5550 Database Design 3 cr.**

Qualifies for CNSS Certification. A detailed examination of the database design process and technology like: data modeling, logical and physical design, data administration, enterprise modeling, data warehouses, Standard Query Language (SQL), and database design tools.

**CIS 5570 Networks 3 cr.**

Qualifies for CNSS Certification. An examination of standardization and design issues for the communication infrastructure. Topics include: Communication hardware and software, standards and protocols (like: OSVISO and TCP/IP.) LAN, EDI. Special emphasis will be placed on

recent advances, network administration and ensuring security of networks and transmitted data.

**CIS 5580 Systems Forensics 3 cr.**

*(Prerequisite: Permission of instructor.)*

This course presents the legal concerns, investigation techniques and incident response tactics of forensic investigation and forensic auditing. It centers around the basic operating system concepts that underlie this area. Students will learn evidence gathering and presentation techniques based around the Windows Incident Response Collection Report (IRCR). They will also learn how to employ IDS and CERT for effective incident response. Students will study the real-world investigation issues and concepts developed through the Honeynet Project.

**CIS 5590 Network Security 3 cr.**

Qualifies for CNSS Certification. This course offers an in-depth understanding of the concepts, principles and practices of network and electronic data security as well as all relevant industry standards. Topics include classic methods for the identification analysis, design and response to network security incidents, in addition to an introduction to the principle set of issues involved with electronic data protection such as pen testing and automated methods for assuring data integrity, confidentiality and availability.

**CIS 5600 National Security Studies 3 cr.**

Qualifies for CNSS Certification. This course offers an in-depth and integrated examination of the range of contextual regulatory and social topics associated with ensuring national security. Topics include the real-world issues associated with deployment of public sector and private sector responses to threats such as crime and terrorism, as well as the socio-economic, legal and regulatory mechanisms that underlie these issues. Cases are analyzed to develop insight into innovative applications of security processes in a variety of industries.

**CIS 5650 Information Ethics 3 cr.**

Qualifies for CNSS Certification. Explores the role of the information professional in today's society. Topics include roles, values and norms, information use, information protection and security, and legal and ethical concerns such as rights of privacy and access.

**CIS 5660 Access Technologies 3 cr.**

*(Prerequisite: CIS 5550 or approval of instructor.)*

Contemporary issues in system access and access control focused but not limited to: access authentication technologies, intrusion detection and penetration testing and non-repudiation services.

**CIS 5700 Information Assurance 3 cr.**

*(Prerequisite: Permission of the instructor.)*

This course presents an overview of the multidisciplinary process of information assurance. It is rooted in the

information assurance body of knowledge (IBOK). The student will learn about the issues involved in creating a systematic information assurance control structure, how to establish systematic security auditing and control procedures and how to build systematic information assurance capability into the IT function.

**CIS 5750 Information Security Management 3 cr.**

*(Prerequisite: Permission of the instructor.)*

The purpose of this course is to educate students in the discipline of information security management. Students will learn how to establish and maintain a systematic security solution for a business organization as well as build systematic information accounting procedures into normal operation. The focus is purely operational best practice rather than theoretical. The outcome will be a fully certifiable information security management system (ISMS).

**CIS 5790 Assurance Processes 3 cr.**

*(Prerequisite: Permission of the instructor.)*

The purpose of this course is to educate students in-depth in the conceptual models for the assurance of information and IT assets. It will present and evaluate a range of process models for that purpose including all of the elements and provisions of federal government standards as encapsulated in NSTISSI 4011 as well as the concepts embodied in both BS 7799 and the IBOK. At the end of this course students will have fully mastered all of the essential concepts and methods for information assurance.

**CIS 5800 Advanced Topics 3 cr.**

CNSS certification. Discussion of current leading-edge issues.

**CIS 582 IT Portfolio Leadership 3 cr.**

*(Prerequisite: CIS 5050 and CIS 5400 or permission of the instructor.)*

This course provides a critical overview of the best practices used to bring about effective change in IT organizations. That includes the development of SOW's and SLA's, analytic support of procurement decisions (buy vs. make - own vs. lease), formal offering management, as well as the implementation of common governance and review processes, financial controls and performance management. This embodies steps to formally tie project/programme progress and outcomes to on-going governance and business decision making based on the entire portfolio.

**CIS 5840 IT Performance Leadership 3 cr.**

*(Prerequisite: CIS 5050 and CIS 5400 or permission of the instructor.)*

This course provides a critical overview of three fundamental areas of IT work: People Care (team building, personnel issues (pay, bonus, flex time, flex place, performance management, career planning, hiring/interviewing); Client Care (establishing Statements of Work, Service Level Agreements, and developing and/or responding to RFP's, as well as overall Client management; and finally Business Issues (Business Planning, Establishing business cases, Governance, Deal

Review Processes, Off Shore resourcing, Ethics and codes of conduct).

**CIS 5890 International Software Management 3 cr.**

*(Prerequisite: CIS 5400 or permission of the instructor.)*

Principles, standards and issues for the international community.

**CIS 5900 Lead Assessor Certification 3 cr.**

Qualifies for CNSS Certification. This course allows the student to receive an internationally accredited Lead Assessor certificate. Several certifications are offered in this course but all are based on completion of a professional examination in audit licensure.

**CIS 5910 Audit 3 cr.**

Qualifies for CNSS Certification. This course presents the fundamental concepts of the IT audit and control process. The purpose is to establish the exact status of an IT operation. Students will create an audit based control structure, establish systematic accounting and control procedures and build complete and coherent information assurance capability into the IT function. This will revolve around defining a control framework, the attendant control objectives and the reporting system for an organization. Guidance for carrying this out will be provided in the form of expert models, however the primary example that will be employed is ISACA's COBIT open standard. The end product of this course should be fully capable of structuring and performing Sarbanes-Oxley, HIPAA and Basel 2 audit programs.

**CIS 5950 Directed Research 3 cr.**

*(Prerequisite: Approval of instructor and director of Graduate Business Programs.)*

This is an intensive study of some special problem taken under the direction of a supervising faculty member.

**CIS 5990 Master's Thesis 6 cr.**

Student should consult the prospective advisor for substantive requirements and the Graduate Business Programs Office for formal requirements.

**MBA 5200 Decision Analysis 3 cr.**

*(Prerequisite: MBA 5120.)*

This course familiarizes the student with frequently used models in decision science and management science. Such models include regression and correlation, forecasting and time series; decision analysis; risk simulation; optimization techniques, e.g., linear programming, modeling, operations research and management science methods.

**MBA 5260 Information Systems and Technology 3 cr.**

A comprehensive study of management information systems and technology, theory and practice. The course presents concepts encompassing strategic impact, technology integration, managing rapidly evolving technologies, IT

sourcing policies, application development process and partnerships and constituencies. The course aims to prepare leaders in managing the use of information, systems and technology to harness the power of new technologies to make better decisions and more effectively manage organizations, thereby enabling them to compete more effectively. This course uses case studies in a team format.

**MBA 5620 Entrepreneurship 3 cr.**

This course covers the entrepreneurial process from conception to birth to adolescence of a new venture. It concentrates on attributes of entrepreneurs/intrapreneurs searching for opportunities, and gathering resources to convert opportunities into businesses. Students learn to evaluate new ventures and develop a business plan to pursue those ventures. It is stressed throughout that new venture development can happen both within and outside an existing organization.