Computer Information Systems Concentration--Management Major

Professor Kabay; Associate Professors Blythe and Stephenson; Assistant Professor Hansen; Lecturers Almagambetov and Bovee; Adjunct Instructor Rowley.

The concentration in Computer Information Systems (CIS) is designed to equip any major with the necessary skills to understand the complexity of today's corporate computing environment. Within the concentration, students will be able to understand the complexities of a computer programming language as well as the many issues surrounding computer security, information assurance, software engineering, and networked systems. The requirements for the concentration include one year of programming classes, a course in the management of information assurance, and one offering of software engineering. This broad look at information systems equips all students in the concentration with skills essential to understanding key concepts in computing environments. The goal of this concentration is to arm students with a rich appreciation and knowledge of the information systems world. It is also the aim of this concentration to augment the any major course of study, thus augmenting their major course of study with a solid mastery of computer system concepts, issues, and skills.

After completion of the concentration, students are able to:

- Understand programming language syntax and logic in order to create software solutions to business problems.
- Understand information assurance and computer security concepts and strategies that are necessary in securing data and networks in today's security-conscious world.
- Understand information systems in the context of their type of business or industry.

Computer Information Systems (CIS) Concentration Courses

IS 130	Introduction to Computing	3
IS 131	Computer Programming	3
IS 301	Software Engineering I	3
IS 342	Management of Information Assurance	3
Major/Concentration Elective		3
Major/Concentration Elective		3
Total Credits		18

Major/Concentration Electives -- Choose two from the following list:

AC		
MG		
IS		
EC		
FN		
QM		
CP		
MA 240	Introduction to Number Theory and Cryptology	3
MA 318	Cryptology	3
MA 370	Introduction to Operations Research	3
CJ 341	Cyber Law and Cyber Crime	3
CJ 442		4
PY 210	Psychology of Leadership	3
AS 311	Air Force Leadership Studies	3
AS 312	Air Force Leadership Studies	3
AS 411	National Security Affairs/Preparation for Active Duty	3
AS 412	National Security Affairs/Preparation for Active Duty	3
MS 311	Military Science III	3
MS 312	Military Science III	3
MS 411	Military Science IV	3
MS 412	Military Science IV	3
NS 321	Naval Ship Systems I	3
NS 342	Small Unit Leadership Skills	2
NS 421	Naval Operations and Seamanship	3
NS 422	Leadership and Ethics	3
Modern Foreign Languages		

Computer Information Systems Minor

(Not open to students with a major in Computer Science or Computer Security or Information Assurance).

Students seeking a minor in Computer Information Systems must obtain the approval of the School Director and must complete all of the six courses listed below, each with a grade of C or higher.

IS 130	Introduction to Computing	3
IS 131	Computer Programming	3
IS 221	G.U.I. Programming [1]	3
IS 228	Introduction to Data Structures	3
IS 240	Database Management	3
One of the following:		3
IS 301	Software Engineering I	3
IS 353	Business Programming Languages	3
IS 406	Special Topics in Computer Science	3
IS 460	Data Communications and Networks (changing to IS 260)	3
Total Credits		18

[1] IS 120 or IS 121 may be substituted for IS 221.

Courses

IS 100 Foundations of CSIA 3 Credits
This survey of computing and information assurance fundamentals is required for computer science and information assurance majors. The course focuses on learning to use key concepts and terminology in information technology, computer science, networking, and information security. Discussions regarding computing ethics, safety, and professionalism are included throughout. No prerequisites. Permission is required for non-computer science and non-information assurance majors to enroll in this course. (3 credits).

IS 120 Business Applications & Problem Solving Techniques 3 Credits
An introductory course in management information processing. The course explores the most important aspects of information systems with specific emphasis on business applications, practical usage, and current information. The student will obtain skills in word processing, spreadsheet analysis, presentation tools and website design using professional software packages. Structured problem-solving techniques will be emphasized thoughout the course. Practical implementation projects and case studies will be used to reinforce topics such as computer, academic, and professional ethics for an information-based society.

IS 121 Introduction to Computer Programming 3 Credits
An introduction to computer programming in a high-level language. This course combines the mechanics of learning a first computer language with the fundamental stylistic elements of general problem solving. Emphasis on the creation of basic gram structures, modular design, and logical flow of control is reinforced by writing programs both in and out of the classroom. Prerequisite: IS 120 or permission of instructor.

IS 130 Introduction to Computing 3 Credits
A breadth-first introduction to the discipline of computing. This course provides a broad survey of the sub-disciplines within computer science and information systems culminating in the exploration fo programming fundamentals. Topics include: hardware survey, software survey, software engineering strategies, algorithmic design, ethics in computing, societal impact of computing, history and theory of computing, and an introduction to information systems and their application, and introductory programming. Throughout the course, responsible computer, academic, and professional ethics in an information-based society will be stressed.

IS 131 Computer Programming 3 Credits
Application of fundamental programming concepts using a high level language. The course will emphasize object-oriented design and implementation techniques. Good software engineering practice will be introduced by means of programming projects that illustrate the importance of software quality attributes. Prerequisite: IS 130.

IS 221 G.U.I. Programming 3 Credits
A study of the design and implementation of the graphical user interface. The course will present fundamentals of usability and human factors in GUI design. One or more of the following will be studied and implemented in a student project: Visual Basic programming, Web programming, GUI code generators. Prerequisite: IS 131.

IS 228 Introduction to Data Structures 3 Credits
An introduction to the basic concepts of data and the techniques used to operate on the data. Topics will include the file handling, searching, sorting, multi linked structures, trees, and graph presentations. Prerequisite: IS 131.

IS 240 Database Management 3 Credits
A study of the concepts and structures necessary to design and implement a database management system. Various data models will be examined and related to specific examples of database management systems. Techniques of system design, system implementation, data integrity, and file security wil be examined. Prerequisite: IS 228.

IS 260 Data Communications and Network 3 Credits

IS 300 Management Information Systems 3 Credits
This course will provide an overview of information systems, their role in organizations, and the relationship of information systems to the objectives and structure of an organization. Management of software projects, decision making with regard to systems development, and organizational roles with regard to information systems will also be discussed. 3 lecture hours.

IS 301 Software Engineering I 3 Credits
An in-depth initiation to the system development life cycle, the techniques of information analysis, and the logical specification of the system. Documentation and communication aids are introduced as well as interpersonal approaches and techniques used in analysis. Prerequisite: IS 240.

IS 302 Software Engineering II 3 Credits
Utilizing tectniques, the student will progress through the phases of specification, design, implementation, and testing of information systems. Object-oriented design techniques are used to design new logical and new physical systems for business related problems. Both technological and managerial aspects of system design and implementation are considered. Students will learn the importance of and design of security systems such as firewalls and passwords. Prerequisite: IS 301.

IS 311 Network Forensics 3 Credits

IS 330 Ethics in Computing & Technology 3 Credits
The course is designed to expose students to some of the ethical dilemmas posed to our culture as a result of the current technological trends. Students will study various ethical standards and creeds offered through a variety of organizations (e.g., ACM) Students will learn to evaluate case studies from an ehtical perspective. Students will be expected to conduct literature surveys, produce bibliographies, write literature reviews, and present oral summaries of research as well as offer critical evaluation of writings related to ethics and technology. This course fulfills General Education Requirement #6: The ability to think critically and make ethical decisions. Prerequisite: one semester of college mathematics.

IS 340 Information Systems Security Assurance I 3 Credits
This course provides an overview of design considerations involved with the security of site design. The course will also provide and understanding of the Levels of Trust and system accreditation/certificate processes. Life cycle management of software, hardware, and physical plant, from planning through destruction will be examined and reinforced using case studies. Additonally understanding of the variety of security systems involving computers and networks and an ability to evaluate vulnerabilities will be discussed.

IS 342 Management of Information Assurance 3 Credits
This course continues the study of information assurance begun in IS 340. The focus is on management of the information assurance process. Topics include human factors in reducing security breaches, security incident detection and response, remediation, management's role in information assurance, and other considerations in framing and implementing information assurance policies. The final section reviews current topics of particular interest and activity in the field of information assurance.

IS 353 Business Programming Languages 3 Credits
A study of progamming languages commonly used in business applications. A working knowledge and appreciation of the power of several business languages are obtained through programming assignments based on business-related subjects such as payroll, mailing lists, and sorting. Prerequisite: IS 228.

IS 370 Introduction to Information Warfare 3 Credits
This course introduces students to the overall concept of Information Warfare (IW) and Information Operations (IO), particularly with regard to the US Federal government and the Department of Defense. Introduction to IW / IO surveys the development of Information Warfare (IW) and Information Operations (IO) as these elements of power have become more important for the United States Department of Defense (DoD) and Federal Government as a whole. The course assumes only a rudimentary familiarity with the basic concepts and terminology of modern Internet usage and computing and is not a technology-focused course. Prerequisites: None. Open to third and fourth year students or by permission of instructor. 3 lecture hours.

IS 380 Offensive Information Operations 3 Credits
This course introduces students to the overall concept of Offensive Information Operations (O-IO), which are conducted across the range of military operations at every level of war to achieve mission objectives. Combatant commanders must carefully consider the potential of IO to deter, forestall, or resolve crises. The course assumes only a rudimentary familiarity with the basic concepts and terminology of modern Internet usage and computing and is not a technology-focused course. Prerequisites: IS 370 Introduction to IW/IO. Open to third and fourth year students or by permission of the instructor. 3 lecture hours.

IS 399 Test Course 3 Credits

IS 406 Special Topics in Computer Science 3 Credits
A study of topics chosen from areas of current interest that are not offered as part of the permanent curriculum. This course may be taken for credit more than once.

IS 407 Politics of Cyberspace 3 Credits
This course explores the interrelations of modern computing and communications technology with politics, power, news, privacy, crime, and creativity. The course assumes only a rudimentary familiarity with the basic concepts and terminology of modern Internet usage and computing and is not a technology-focused course. Open only to juniors and seniors. 3 lecture hours.

IS 410 Computing Internship 3 Credits
Internships within CS/CIS are designed to provide computing majors with the opportunity to apply and expand their knowledge within the computing discipline. The student must be a junior or senior at the time of enrollment and have good academic standing. The student must have the internship approved beforehand by a faculty member in CS/CIS and have the written consent of the CS/CIS Program Coordinator. In addition, a supervisor within the sponsoring organization must agree to provide a written description of the internship beforehand, and provide progress reports during and after the internship experience.

IS 411 Cyber Investigation 3 Credits
This course is an introduction to cyber investigation. It includes elements of cyber crime, cyber warfare and cyber terrorism. The course will examine investigative techniques for cyber investigators, case studies of representative cyber crimes and cyber warfare incidents, some cyber investigation tools and expert witnessing. The course builds up to a mock trial where students act as a cyber investigation task force on an actual case of cyber crime. This is a course that incorporates extensive reading as well as hands-on lab exercises. No prerequisites. Open to third and fourth year students or by permission of the instructor. 3 lecture hours.

IS 440 Software Engineering III 3 Credits
An advanced course in the field of Software Engineering. Students will refine their use of the methods and procedures of software development from conception of an idea through its implementation and beyond. A variety of software process models will be studied. The course will seek to balance theoretical foundations with practical application. A team project will be assigned to allow for the application of software engineering techniques. The course will investigate methodologies and research with the purpose of improving personal and organizational quality and productivity. Classroom 3 hours. Prerequisites: IS 302 or permission of the Instructor.

IS 455 Comtemporary Issues in Computer Science 3 Credits
A capstone seminar which will vary every term in accordance with the current issues of the time. Students are to work with the instructor as they explore today's issues and trends in preparation of a thesis or project. Emphasis will be placed on critical thinking, research and evaluation of current issues. A comprehensive computer exam is included in this course. Each student will be required to prepare a paper outlining ethical standards based on the student's life experiences. Prerequisites: IS 302, or permission of the instructor.

IS 460 Data Communications and Networks 3 Credits
An introductory study in fundamental concepts of computer networks and data communication including a survey of major protocols, standards, and architectures. Students will implement simple data communication protocols in the laboratory. Prerequisite: IS 228.