# Department of Computer Information Systems and Management Science

Dr. Richard G. Mathieu, Head

Phone: (540) 568-3064
Location: Zane Showker Hall, Room 234
E-mail: mathierg@jmu.edu
Web site: www.jmu.edu/cis/

Professors

T. Dillon, I. Markham, R. Mathieu, M. Mitri, S. Palocsay, S. Stevens, F. Teer

Associate Professors

M. Busing, S. Kruck, D. Lending, D. Musselman, H. Reif, G. Smith, P. Wang

Assistant Professors

Y. Choi, R. Pal

Instructors

C. Cole, J. May, M. Ratcliffe, T. Wood

## Mission Statement

The computer information systems and management science program prepares students for careers in designing, developing, implementing, and managing information systems. The field of CIS, using the latest computer-based technology, centers on significant problems in organizing, representing and manipulating data, information and knowledge.

Students majoring in CIS will have the opportunity to study a variety of programming languages, Internet technologies, object-oriented concepts, database design, computer security, networking, telecommunications, and mathematical modeling. The course work focuses on business applications and analysis. Students are offered the opportunity to gain practical technical experience through internships and co-op programs.

The CIS & MS faculty use a variety of teaching methods including lectures, cases, projects and business simulations to prepare graduates with strong technical, analytic, and problem-solving skills, effective communication and presentation skills, hands-on experience, and the ability to work effectively in individual and team-oriented environments.

## Objectives

- Students will demonstrate proficiency in the programming of object-oriented, event-driven, database-enabled applications with graphical user interfaces in at least two modern programming languages. Programming proficiency will include conceptual design, elegant and efficient coding, complete testing and debugging, and meaningful documentation.
- Students will demonstrate understanding of database concepts and proficiency in developing effective data models, designing and implementing relational databases, and manipulating data using structured query language.
- Students will demonstrate the ability to use appropriate systems analysis and design tools and techniques.
- Students will understand the concept of systems life cycle and the importance of involving users in systems design.
- Students will demonstrate proficiency in understanding system architectures, including hardware components, operating systems, data representations, administration and performance monitoring. Demonstration of this proficiency will include conceptual knowledge and practical applications. Students will demonstrate advanced proficiency in using at least one software application.
- Students will demonstrate proficiency in understanding technical fundamentals of telecommunications, data, and voice communications, with particular focus on communications networks and transmission media. Students will gain in-depth experience of networking and telecommunications fundamentals including local area networks, metropolitan area networks, wide area networks, intranets, the Internet and the World Wide Web. Students will practice the installation, configuration, systems integration and management of infrastructure technologies in hands-on lab sessions.
- Students will demonstrate the communication, interpersonal relationship, management, problem solving and professional skills needed to effectively complete assignments independently and in groups.

## Career Opportunities

Computer information systems professionals analyze business opportunities and problems, then design and build solutions using the power of information technologies. Students in the CIS program gain the business and technical skills that will prepare them to move quickly from technical to leadership roles with the organization.

- Business Analyst
- Consultant
- Data Administrator

- Information Systems Manager
- Information Technology Trainer
- Project Manager
- Security Specialist
- Software Developer
- Systems Administrator
- Systems Analyst
- Telecommunications Analyst
- Web Developer

# Co-curricular Activities and Organizations

The Association for Information Technology Professionals (AITP) is the oldest and most successful IT professional association. AITP is comprised of over 200 local chapters in the United States and Canada with over 13,000 professional and student members. The James Madison University Chapter of the AITP, founded in 1980, provides a valuable link to the business world by giving students exposure to career opportunities in the computer information systems field. JMU students are active participants in the Annual AITP National Collegiate Conference.

# Degree and Major Requirements

The B.B.A. in computer information systems is accredited by the Accreditation Board for Engineering and Technology (ABET)'s Computing Accreditation Commission.

## Bachelor of Business Administration in Computer Information Systems

The B.B.A. in computer information systems requires a minimum of 120 credit hours of undergraduate work. Sixty credit hours will typically be taken outside the College of Business. In counting the 60 credit hours of non-business courses, B.B.A. students may include all hours taken in General Education (usually 41), up to a total of nine hours in economics (GECON courses must be counted as economics) and three hours of COB 191, Business and Economic Statistics. The remaining hours will be taken from any department outside the College of Business. Students should carefully select these non-business electives to help them gain additional knowledge and expertise for their careers and personal lives. The credit hour requirements for each of the program components are listed below.

### Degree Requirements

| | Credit Hours |
|---|---|
| B.B.A. core courses[1] | 39 |
| CIS major requirements | 28 |
| General Education courses[2] | 41 |
| Non-business electives | 12 |
| | 120 |

1 Assumes that MATH 205 and *G*ECON 200 are taken as General Education courses.

2 The General Education program contains a set of requirements each student must fulfill. The number of credit hours necessary to fulfill these requirements may vary.

### Major Requirements

| Core Courses | Credit Hours |
|---|---|
| CIS 221. Principles of Programming | 3 |
| CIS 301. Operating Systems and Server Administration | 1 |
| CIS 304. Information Technology | 3 |
| CIS 320. Telecommunications and Information Processing | 3 |
| CIS 330. Database Design and Application | 3 |
| CIS 331. Intermediate Computer Programming | 3 |
| CIS 454. Systems Analysis and Design | 3 |
| CIS 484. Information Systems Development and Implementation | 3 |
| Two computer information systems electives | 6 |
| | 28 |

| Computer Information Systems Electives | Credit Hours |
|---|---|
| CIS 354. Advanced Visual BASIC Programming | 3 |
| CIS/MS 363. Business Process Management | 3 |
| CIS/MS 364. Decision Support Systems | 3 |
| CIS 366. Web Development | 3 |
| CIS 383. Introduction to UNIX and PERL | 3 |
| CIS 411. Computer Forensics for Business | 3 |
| CIS 434. Information Technology Consulting | 3 |
| CIS 420. Computer-Based Networking | 3 |
| CIS 424. Computer Security Management | 3 |
| CIS 464. Information Systems Project Management | 3 |
| CIS 466. Advanced Web Development | 3 |
| CIS 498. Special Topics in Computer Information Systems | 3 |

Students majoring in CIS are highly encouraged to complete an internship in computer information systems for non-academic credit (CIS 361).

# Concentrations

## Concentration in Cooperative Education

### Dr. Donald L. Musselman, Coordinator

The cooperative education concentration in CIS & MS offers highly qualified undergraduate majors the opportunity to participate in a six- to eight-month professional experience with well-recognized industry leaders in information technology and operations. Students will be awarded 12 hours of academic credit that will substitute for two required courses in the CIS & MS curriculum and for six credits of special topics (CIS 498 or MS 498). Substitution for the two specific courses will be made based on the structure and context of the co-op experience and in cooperation with the co-op firm.

Students must demonstrate competency via examination in the two required courses selected in order to receive credit in those courses. Students who have at least a 3.0 grade point average, are majors in CIS and have fulfilled all of their COB core requirements (except COB 487, Strategic Management) are eligible to apply on a competitive basis through the CIS & MS office.

Students who want to participate in a co-op program must apply both to the CIS & MS program office and the participating firm at least three months in advance of the start of the co-op. Co-ops typically begin in January or May and last six to eight months. Course substitutions must be approved in conjunction with the co-op coordinator in the CIS & MS office and the co-op coordinator in the firm.

A program of study must be placed on file for each student who is accepted for a co-op prior to beginning the co-op experience. Students may participate in a co-op during their junior or senior years, but they are limited to one co-op. Students who want to participate in a co-op as postgraduates may do so as special students. These students will receive a certificate on successful completion of the co-op experience. Prerequisite: CIS majors with junior standing and a minimum 3.0 grade point average.

# Minor Requirements

The minor in computer information systems is structured to provide the student not majoring in CIS with the opportunity to develop the working knowledge necessary to apply information technology to business opportunities and problems. Students with a major in accounting may substitute ACTG 313 for the CIS elective.

## Computer Information Systems Minor

| Required Courses | Credit Hours |
|---|---|
| COB 204. Computer Information Systems | 3 |
| CIS 221. Principles of Programming | 3 |
| CIS 304. Information Technology | 3 |
| CIS 330. Database Design and Application | 3 |
| CIS 454. Systems Analysis and Design | 3 |
| CIS elective | 3 |
| | 18 |

## Management Science Minor

### Dr. Scott P. Stevens, Coordinator

Management science is a scientific approach to analyzing problems and making business-related decisions. It uses statistics and mathematical modeling to forecast the implications of various choices and identify the best alternatives. Management scientists focus on the effective use of data and information to drive positive business actions. The minor in management science prepares students to solve complex decision problems in a business environment with a combination of quantitative skills and hands-on expertise using current software applications. The program is open to any undergraduate with an interest in management science. The minor consists of nine credit hours of required course work and nine credit hours of management science (MS) electives. At most three courses can be used to satisfy both the management science minor and a student's major requirements.

| Required Courses | Credit Hours |
|---|---|
| Choose one of the following: | 3-4 |
| COB 191. Business and Economic Statistics | |
| MATH 220. Elementary Statistics | |
| MATH 285. Data Analysis | |
| MATH 318. Introduction to Probability and Statistics | |
| COB 291. Introduction to Management Science | 3 |
| CIS 221. Principles of Programming | 3 |
| Electives (choose three of the following): | 9 |
| CIS/MS 363. Business Process Management | |
| CIS/MS 364. Decision Support Systems | |
| MS 391. Quantitative Business Modeling | |
| MS 393. Business Analytics: Data Mining | |
| | 18-19 |

# Recommended Schedule for Majors

Computer information systems majors should follow the course schedule described here to complete the final two years of their program. It is possible to deviate from this program, but care must be taken to ensure that all course prerequisites are met._

First Two Years

Students normally take the 29-30 hour lower-division B.B.A. core curriculum along with many of the General Education curriculum. All lower-division core requirements must be completed before enrolling in the upper-division core courses. It is recommended that CIS 221 (Principles of Programming) be completed in the second semester of the second year.

Third Year

| First Semester | Credit Hours |
|---|---|
| COB 300A. Integrated Functional Systems: Management | 3 |
| COB 300B. Integrated Functional Systems: Finance | 3 |
| COB 300C. Integrated Functional Systems: Operations | 3 |
| COB 300D. Integrated Functional Systems: Marketing | 3 |
| CIS 304. Information Technology | 3 |
| | 15 |

| Second Semester | Credit Hours |
|---|---|
| CIS 320. Telecommunications and Information Processing | 3 |
| CIS 330. Database Design and Application | 3 |
| CIS 331. Intermediate Computer Programming | 3 |
| Two General Education electives | 6 |
| | 15 |

Fourth Year

| First Semester | Credit Hours |
|---|---|
| CIS 361. Computer Information Systems Internship | 0 |
| CIS 454. Systems Analysis and Design | 3 |
| CIS 484. Information Systems Development and Implementation | 3 |
| One Computer Information Systems elective | 3 |
| One General Education elective | 3 |
| One General Education or non-business electives | 3 |
| | 15 |

| Second Semester | Credit Hours |
|---|---|
| COB 487. Strategic Management | 3 |
| One Computer Information Systems elective | 3 |
| CIS 301. Operating Systems and Server Administration | 1 |
| Two General Education or non-business electives | 6 |
| | 13 |