
Computer Information Systems

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[Print Version of Catalog](#) ■

Department of Computer Information Systems and Business Analytics

Mission Statement

The [Department of Computer Information Systems and Business Analytics](#) is committed to:

- Educating students by creating an active, experiential learning environment that prepares them to apply knowledge of information systems, operations, business analytics and business for the betterment of organizations and society; and
- Serving the academic community and business communities through appropriate research and service.

Objectives

Computer information systems (CIS) is offered as a major through the [Department of Computer Information Systems and Business Analytics](#). This program prepares business students for careers as information systems professionals. The program of study focuses on the development and management of information systems in a business environment. Students develop the technical skills and organizational insights required to analyze, design, implement and administer information systems. The CIS curriculum includes hands-on projects, laboratory exercises, case analysis and business simulations to build strong technical and analytical skills, effective oral and written communication skills, and the ability to work independently and in team-

oriented environments. Students are offered the opportunity to gain practical experience through internships and co-op programs. The department faculty endorses the program educational objectives listed below.

The CIS B.B.A. program will produce graduates with the ability to:

- Analyze a problem and identify the computing requirements appropriate to its solution.
- Apply sound analysis and design methodologies toward creating technological solutions for the enhancement and improvement of business processes.
- Implement system solutions using state-of-the-art software development, database, telecommunications and security technologies in a global business environment.
- Assess security threats risks to technology assets and suggest security controls to prevent, detect and repair the security threats.
- Communicate effectively, in both oral and written form, in order to serve as liaisons between business-oriented end users and technically-oriented computing specialists.
- Work effectively in multi-disciplinary teams with the ability to manage themselves and their colleagues.
- Develop self-directed, lifelong engagement in the profession and professional development.

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 within the organization.

- Consultant
- Business Analyst
- Business Intelligence Specialist
- Computer Forensics Specialist
- IT/IS Auditor
- IT/IS Consultant
- Risk Analyst
- Security Consultant
- Systems Analyst
- Telecommunications Analyst
- IT/IS Manager
- Application Development Manager
- Business Owner (IT/IS Industry)
- Chief Information Officer
- Chief Security Officer
- Data Warehousing Manager
- Information Systems Manager
- Program Manager
- Project Manager
- IT Operations Professional
- Database Administrator

- Information Technology Trainer
- Network and Systems Administrator
- Security Specialist
- Software Engineer
- Web Developer

Co-curricular Activities and Organizations

The JMU Chapter of the [National Association for Information Systems](#) (AIS) was started in 2014 and serves to advance knowledge and to promote excellence in the practice and study of information systems. Along with providing premier networking opportunities with top consulting firms, AIS provides student members the ability to engage in national student competitions, in-house tutoring activities, professional development workshops, and various fundraising and social events.

Accreditation

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

Degree and Major Requirements

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 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 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.

Degree Requirements

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

1 Assumes that [MATH 205](#) and [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 . Enterprise Architecture	3
CIS/CS 320 . Computing and Telecommunications Networks	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
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Electives	Credit Hours
CIS 354 . Advanced Visual BASIC Programming	3
CIS 366 . Web Design and Development	3
CIS 411 . Computer Forensics for Business	3
CIS 420 . Computer-Based Networking	3
CIS 424 . Computer Security Management	3
CIS 425 . Defensive Cybersecurity	3
CIS 428 . Mobile Computing and Security	3
CIS 434 . Information Technology Consulting	3

CIS 463 . Business Intelligence	3
CIS 464 . Information Systems Project Management	3
CIS 466 . Advanced Web Development	3
CIS 490 . Special Studies in Computer Information Systems	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

Coordinator: [Dr. Tom Dillon](#)

The cooperative education concentration in CIS and BSAN 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 and BSAN curriculum and for six credits of special topics ([CIS 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 GPA, 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 and BSAN office.

Students who want to participate in a co-op program must apply both to the CIS and BSAN 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 and BSAN 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

Computer Information Systems Minor

Coordinator: [Dr. Michel Mitri](#)

The minor in computer information systems is primarily structured to provide students in various disciplines on campus with the opportunity to study business-oriented information systems.

Admission to the CIS minor is based on a student's performance in one course from each of the following seven competency areas:

- One introductory information-systems course ([COB 204](#) or equivalent as determined by the department head)
- One introductory computer programming course ([CIS 221](#), [ISAT 252](#), [CS 139](#) or equivalent as determined by the department head)
- One calculus course ([MATH 205](#), [MATH 231](#), [MATH 235](#), [ISAT 151](#) or equivalent as determined by the department head)
- One statistics course ([COB 191](#), [MATH 220](#) or equivalent as determined by the department head)
- One critical thinking course (student's Cluster One critical thinking course or equivalent as determined by the department head)
- One writing course ([WRTC 103](#) or equivalent as determined by the department head)
- One quantitatively-oriented economics/business course ([ECON 200](#), [ECON 201](#), [COB 241](#), [COB 242](#), [COB 291](#) or equivalent as determined by the department head)

Admission is based on weighted average of student's highest grades in one course from each of the seven competency areas and is subject to space availability of CIS courses. Students seeking to add the CIS minor may submit an application to the CIS & BSAN department at any time.

Required Courses	Credit Hours
COB 204 . Computer Information Systems	3
CIS 221 . Principles of Programming	3
CIS 304 . Enterprise Architecture	3
CIS 330 . Database Design and Application	3
CIS 454 . Systems Analysis and Design	3
CIS elective	3
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Business Analytics Minor

Business analytics is a technical approach to analyzing problems and making business-related decisions. It uses statistical methods, management science techniques, and mathematical modeling to forecast the implications of various choices and identify the best alternatives. Business analytics focuses on the effective use of data and information to provide fact-based insights and drive positive business actions. The minor in business analytics 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.

Admission to the BSAN program is limited and competitive. Students seeking to add the BSAN minor must submit an application by November 1. Students will be admitted as a cohort each fall to start the BSAN program in the spring.

To be eligible to apply for admission, students must have completed the following:

- Prerequisites for [COB 291](#). Introduction to Management Science:
- [MATH 205](#). Introductory Calculus I or equivalent
- [COB 191](#). Business Statistics or equivalent
- [COB 291](#). Introduction to Management Science with a grade of "B-" or higher
- [ECON 200](#). Introduction to Macroeconomics or [ECON 201](#). Introduction to Microeconomics

In addition, a student must be able to take the 300-level BSAN courses on a schedule of one per semester in a three-consecutive semester period.

A complete application to the minor includes the following:

- A completed BSAN minor application form
- A letter of recommendation from [COB 291](#) instructor

Admission to the BSAN minor depends on a student's performance in one course from each of the four competency areas:

- One introductory management science course ([COB 291](#) or equivalent)
- One introductory calculus course ([MATH 205](#), [MATH 231](#), [MATH 235](#), [ISAT 151](#) or equivalent)
- One statistics course ([COB 191](#), [MATH 220](#), [MATH 285](#), [MATH 318](#), [ISAT 251](#) or equivalent)
- One economics course ([ECON 200](#) or [ECON 201](#))

Students may use transfer and/or college credits that have been accepted by JMU to meet competency requirements. Admission is based on an average of a student's highest grades in one course from each competency area and the letter of recommendation. Only grades earned at JMU and verified by the registrar will be used; transfer transcripts will also be reviewed. More emphasis will be placed on grades than on the recommendation letter. Following review by the BSAN Admission Committee, students will be notified about their acceptance into the minor. If accepted, students will be eligible to register for BSAN courses.

Required Courses **Credit Hours**

Choose one of the following: COB 191 . Business Statistics ISAT 251 . Topics in Applied Statistics MATH 220 . Elementary Statistics MATH 285 . Data Analysis MATH 318 . Introduction to Probability and Statistics	3-4	
COB 291 . Introduction to Management Science ²	3	
BSAN 391 . Quantitative Business Modeling	3	
BSAN 392 . Descriptive and Predictive Analytic Methods	3	
CIS/BSAN 393 . Predictive Analytics and Data Mining	3	
Electives		Credit Hours
Choose one of the following: CIS 463 . Business Intelligence CS/ISAT 344 . Intelligent Systems ECON 385 . Econometrics FIN 475 . Financial Modeling and Risk Analysis MATH 322 . Applied Linear Regression MKTG 482 . Marketing Analytics	3	

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1 Prerequisite for [BSAN 391](#), [BSAN 392](#) and [CIS/BSAN 393](#).

2 [COB 191](#) and [MATH 205](#) or equivalent are prerequisites for COB 291. A grade of "B-" or higher in [COB 291](#) or equivalent and junior or senior standing are prerequisites for taking the subsequent required courses ([BSAN 391](#), [BSAN 392](#), and [CIS/BSAN 393](#)) in the business analytics minor.

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 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 . Enterprise Architecture	3
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Second Semester	Credit Hours
CIS 301 . Operating Systems and Server Administration	1
CIS 320 . Computing and Telecommunications Networks	3
CIS 330 . Database Design and Application	3
CIS 331 . Intermediate Computer Programming	3
Two General Education electives	6
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Fourth Year

First Semester	Credit Hours
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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
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Second Semester	Credit Hours
COB 487 . Strategic Management	3
One Computer Information Systems elective	3
Two General Education or non-business electives	6
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