McCoy Hall Room 404  
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isa.mccoy.txst.edu (http://www.isa.mccoy.txst.edu/)

The mission of the Department of Computer Information Systems and Quantitative Methods (CISQM) is to provide relevant educational opportunities to students wishing to pursue professional careers related to information systems, technology and data analytics.

The department strives to create an environment for preparing individuals for a lifetime of learning and growth by producing graduates who understand the concepts and uses of information systems and are capable of applying these concepts to business and government.

CISQM graduates pursue careers as IT integrators, global enterprise system architects, database administrators, network administrators, information security analysts, business systems analysts, application developers, digital-business solution developers, and information systems managers. Graduates work for technology companies, high-tech startup companies, government agencies, accounting firms, oil companies, financial and insurance institutions, retail firms, manufacturing corporation, and consulting companies where they are succeeding at the highest levels.

### Degree Programs Offered

**Bachelor of Business Administration (B.B.A.), major in Computer Information Systems**

The computer information systems curriculum provides a strong foundation in the concepts and applications of information systems and technology in organizations. It gives CISQM majors the opportunity to study enterprise design, business intelligence, data analytics, database development, network and security administration, programming languages, and the integration of hardware and software systems with management practices.

The Concentration in Business Analytics, will prepare students for the emerging world of Big Data and how to effectively analyze business situations for optimal decision making. The concentration consists of 15 hours of undergraduate coursework that may be accommodated within the 120 hours required in the undergraduate business curriculum. More information is available in the McCoy College Academic Advising Center.

**AACSB Accreditation**

The McCoy College of Business is accredited by the Association to Advance Collegiate Schools of Business (AACSB). AACSB Accreditation is known, worldwide, as the longest standing, most recognized form of specialized/professional accreditation an institution can earn.

### Bachelor of Business Administration (B.B.A.)

- Major in Computer Information Systems (http://mycatalog.txstate.edu/undergraduate/mccoy-business-administration/computer-information-systems-quantitative-methods/computer-information-systems-bba/)
- Major in Computer Information Systems (Software Development Concentration) (http://mycatalog.txstate.edu/undergraduate/mccoy-business-administration/computer-information-systems-quantitative-methods/cis-software-dev-bba/)

### Certificate

- Computer Information Systems

### Minor

- Data Analytics

### Subjects in this department include: CIS (p. 1), QMST (p. 4)

### Courses in Computer Information Systems (CIS)

**CIS 1323. Introduction to Microcomputer Applications.**

This course develops advanced information technology skills, focusing on office productivity software. Primary emphasis is placed on spreadsheet, database, and presentation software. Advanced techniques are presented for use in data analysis and decision-making. Students will be expected to demonstrate mastery of these techniques in a hands-on environment.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Dif Tui- Business Admin  
Grade Mode: Standard Letter  
TCCN: BCIS 1305

**CIS 3305. Visual Programming I.**

This course provides an introduction to application program development including requirement analysis, design, implementation, and testing. A blend of structured and object-oriented concepts is used to form solutions to business problems using a visual programming language. Prerequisite: CIS 1323 with a grade of “D” or better and a minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Dif Tui- Business Admin  
Grade Mode: Standard Letter

**CIS 3317. E-Business.**

Explores the constantly changing world of e-Business from an international perspective. This course will emphasize e-Business challenges and opportunities in the worldwide marketplace, while focusing on global issues of management, implementation, and integration of IT resources. (MULT) Prerequisite: A minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Dif Tui- Business Admin/Multicultural Content  
Grade Mode: Standard Letter
CIS 3325. Visual Programming II.
An advanced visual programming course covering topics related to the
design and implementation of user interface, business logic and data
access in a tiered architecture. The emphasis is on techniques that
take advantage of a development framework through the use of forms,
classes, and objects. Corequisite: CIS 3374 and CIS 3382 both with
grades of "D" or better and a minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

This course examines the concepts of information systems and network
availability, integrity, and confidentiality in order to develop effective
security controls, processes, practices, and procedures. Topics include
methodologies, models, architectures, access control systems, ethics,
and legal implications of IT security. Prerequisite: A minimum 2.0 Overall
GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 3360. Web Design and Development.
This course focuses on the design, creation, and maintenance of
websites. It covers fundamental technologies for structuring and
presenting content on the web and development framework for creating
mobile-first web pages. Prerequisite: A minimum 2.0 Overall GPA.

Corequisite: CIS 3374 with a grade of "D" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 3374. System Analysis and Design.
The analysis and general design phases of the system development life
cycle are reviewed. Emphasis on techniques and tools for determining
systems requirements that lead to the development of logical design
models using structured and object-oriented methodologies. (WI)
Prerequisite: A minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin|Writing Intensive
Grade Mode: Standard Letter

CIS 3380. Enterprise Information Technology and Business Intelligence.
Students will extend their ability to effectively use integrated software
applications to identify and provide access to various information
sources. The course will focus on applying information and Internet
Technologies that span normal business functions for the development
and implementation of solutions to managerial problems. Prerequisite:
CIS 1323 and [QMST 2333 or MATH 2328] and [MATH 1329 or
MATH 2331 or MATH 2471] all with grades of "D" or better and a
minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

Concepts and methodology of planning, design, development, and
management of the computerized data base. The emphasis is on logical
database design and a study of relational implementation. A relational
DBMS with a relational query language is used for the development of a
business application system. Prerequisite: CIS 2324 or CIS 3305 with a
grade of "D" or better and a minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

This course emphasizes the development of data processing software.
Topics include designing applications for analyzing and manipulating
numerical and textual data from external data sources. Sequence and
collections structures, object serializations, design techniques, and
reporting will be examined. Prerequisite: [CIS 2324 or CIS 3305] and
[QMST 2333 or MATH 2328] both with grades of "D" or better and a
minimum 2.0 Overall GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 3390. Agile Project Management.
An introduction to project management body of knowledge as applied to
Information Technology projects with emphasis on Agile Methodologies.
The management of scope, costs, schedules, quality, risks, program
management, system methodologies, material procurement, human, and
international issues will be examined. Prerequisite: CIS 3374 and [CIS
2324 or CIS 3305] with a grade of "D" or better and a minimum 2.0 Overall
GPA.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

Advanced use of object-oriented programming in the development of
business applications. Concepts, methodology, and toolsets for
designing, implementing, and testing applications in object-oriented
paradigm. Prerequisite: CIS 3374 with a grade of "D" or better and a
minimum 2.0 Overall GPA. Corequisite: CIS 3382 with a grade of "D" or
better.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter
CIS 4321. Mobile Application Development for Android.
This course introduces the concepts, methodology, and toolset for designing business applications for mobile devices. Students will learn the MVC development framework and Java programming environment for Android to create interactive business applications. Prerequisite: CIS 3374 with a grade of "D" or better and a minimum 2.0 Overall GPA. Corequisite: CIS 3382 with a grade of "D" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

A course that integrates systems development with analysis, design, project management, and the systems development life cycle. Object-oriented methods and UML models will be used to develop a project for a client. Students will select methodology, platform, and development technology based on client requirements. Prerequisite: CIS 3325 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

The use of advanced information technology for integrating business functions in an enterprise through distributed databases is emphasized. Methodology and tools for the selection and implementation of Enterprise Resource Planning (ERP) systems are discussed. Students will use available ERP software to create, track and communicate enterprise information. Prerequisite: CIS 3380 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 4348. Data Communications and Network Architecture.
A course oriented to the technical concepts of data communications and network designs and how they relate to contemporary computer end-user environments. It incorporates the systems approach for understanding, designing, managing, securing, and implementing data communication networks. Special attention is paid to network protocols (TCP/IP) and the OSI model. Within this course students analyze and design data communications networks for business problems. Course contains labs which includes simulations of network systems providing hands-on experience with networking configurations, concepts, and hardware. Prerequisite: A minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

This course introduces advanced concepts and database processes to support applications for Business Intelligence. Multi-dimensional modeling along with database, reporting, and analysis capabilities of a modern database environment will be used to design and develop stored procedures, views, user-defined functions, reports and multi-dimensional information cubes. Prerequisite: CIS 3382 with a grade of "D" or better and a minimum 2.0 Overall GPA. Corequisite: QMST 3339 with a grade of "D" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 4350. Ethical Hacking.
This course focuses on the technology and managerial issues related to information systems security. Topics include: Attack methods, access control, authentication, firewalls, incident and disaster response, disaster recovery, security function management, and cryptography. Prerequisite: CIS 4348 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 4358. Network and Cloud Administration.
This course provides students with an understanding of the responsibilities assigned to network administrators. Students will acquire a working knowledge of these responsibilities and skills using tools and technologies for administering enterprise networks via network operating systems commonly used in modern business enterprises. Students will also gain knowledge of cloud environments and the challenges created in both cloud and hybrid networking configurations. Prerequisite: CIS 4348 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

CIS 4360. Developing Business Solutions for the Enterprise.
An introduction to the concepts, methodology, and toolsets for the architecture, design, implementation, and deployment of business solutions for the enterprise in a services-oriented computing environment. Topics include services-oriented architecture, "Software as a Service" framework, n-tier development of business and data services, and application security. Prerequisite: CIS 3325 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter
CIS 4373D. Artificial Intelligence in Business Operations.
This course explores the impact of artificial intelligence (AI) on modern businesses, and this course offers a clear introduction to AI concepts such as machine learning, natural language processing, and computer vision. Discover practical applications of AI in marketing, finance, and more through hands-on exercises and real-world examples. Gain the skills and knowledge needed to make informed decisions in an AI-driven business landscape. Prepare for the future by understanding how AI can transform various aspects of organizations. This course provides a foundational understanding of AI's role in shaping the business world.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

This course is designed to cover all aspects of historical cyberwarfare incidents (those including nation-state actors). This will touch on the political and/or social actors for each occurrence covered, the timeline of events leading up to, and including the actual incursion or event, the technical explanation for what occurred, and the fallout and impact of the event. Prerequisite: A minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

This course aims to highlight the ongoing requirement for developers specializing in legacy application support. It focuses on their role in developing, maintaining, supporting, and migrating mission-critical legacy applications within modern, high-volume transactional organizations. The main aspects covered in the course are: Key Language Proficiency and Development Processes and Insights from Industry Experts: Students will gain proficiency in essential legacy application languages and processes. This will enable them to effectively develop, modify, test, and troubleshoot legacy mission-critical applications. Practical assignments will provide hands-on experience in these areas. Featured guest speakers from IT Legacy organizations will be scheduled. Prerequisite: CIS 2324 or CIS 3305 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

CIS 4373M. Applied Artificial Intelligence: Development and Application.
This course immerses students in Large Language Models and Generative Pre-trained Transformers (GPT). They will master both the theoretical foundations and practical aspects of development. Activities include building custom models, fine-tuning existing ones, and delving into advanced transformer architectures. The course covers real-world applications such as text generation, translation, and chatbots. Additionally, it addresses ethical considerations, bias detection, and model interpretability. Through applied projects, students acquire expertise relevant to AI-driven industries and research, positioning them to meet the demands of the rapidly changing business landscape. Prerequisite: CIS 2324 or CIS 3305 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

CIS 4395. Independent Study in Computer Information Systems.
An in-depth study of a single topic or related problem solved through computer information systems research. May be repeated once for credit with a different emphasis. Prerequisite: Instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

This one-semester course involves an internship in business information systems. Emphasis is on the application of computer information systems theory to business problems in the area of computer based management information systems. Repeatable once with different emphasis for credit. Prerequisite: Instructor approval.
3 Credit Hours. 0 Lecture Contact Hours. 15 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Credit/No Credit

Courses in Quantitative Methods (QMST)
QMST 2300. Introduction to Analytics.
This course introduces data science and analytics fundamental concepts and applications. It covers the use of visualization software, and describes the use of data wrangling, descriptive, predictive and prescriptive analytical models. It discusses the ethical and societal implications of analytics, and development of data storytelling.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter
This introductory course covers descriptive and inferential statistical techniques for business and economic decision making. Topics include measures of central tendency and dispersion, probability distributions, sampling distributions, confidence intervals, hypothesis testing, simple linear regression, and correlation analysis. Prerequisite: CIS 1323 and [MATH 1329 or MATH 2331 or MATH 2471] both with grades of "D" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter
TCCN: BUSI 2305

QMST 3334. Statistical Modeling.
Students will learn to apply a broad range of statistical analysis techniques using statistical software in business decision-making. Topics include applied modeling techniques, such as regression modeling, time-series modeling and analysis of variance; non-parametric methods; quality control; and simulation. Prerequisite: QMST 2333 or MATH 2328 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

QMST 3339. Data Mining and Visualization.
This course introduces data mining concepts and practical skills for applying data mining techniques to solve business problems. It emphasizes data visualization and data analysis algorithms (e.g., prediction, classification, clustering), systematic evaluation and model assessment for big data sets. Prerequisite: QMST 2333 or MATH 2328 or [QMST 2300 and [GEO 3301 or PSY 2301 or IE 3320 or SOCI 3307 or PH 3315]] with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

QMST 3341. Computational Methods for Analytics.
This is an introductory course in statistical programming. The objective of this course is to use programming tools and statistical methods to analyze large data sets. Topics covered are graphs used for statistical analysis and modeling, visualization, simulation, and optimization. Prerequisite: QMST 2333 or MATH 2328 or [QMST 2300 and [GEO 3301 or PSY 2301 or IE 3320 or SOCI 3307 or PH 3315]] with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

QMST 4314. Decision Analytics.
This course introduces the theory, algorithms and applications of decision making methods that are used in analyzing and solving business problems. The methods to be discussed include linear programming, integer programming, network optimization, simulation, and decision models with uncertainty. Prerequisite: A minimum 2.0 overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

QMST 4320. Data Analytics.
This course will introduce various techniques available to extract useful information from massive datasets. The course will emphasize advanced analytical theory and methods such as: clustering, association rules, regression, classification and In-Database analytics. The course will also include techniques used for data preparation, discovery, and model building. Prerequisite: QMST 3339 or QMST 3341 either with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Dif Tui- Business Admin
Grade Mode: Standard Letter

QMST 4373D. Operations Analytics.
This course introduces the analytics concepts and tools used in planning and managing business operations. The course emphasizes forecasting, service systems and queueing analysis; optimization, decision analysis, and simulation; and quantitative supply chain analysis. Topics include but are not limited to inventory control, logistics and distribution planning, process analysis, and quality management. Prerequisite: A minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Business Admin|Topics
Grade Mode: Standard Letter

QMST 4373E. Predictive Analytics.
This course covers the use of predictive analytics methods such as advanced regression and classification to solve business problems. Particular topics include feature selection and shrink-age methods such as ridge and lasso regression; deep neural network learning; ensemble methods based on bagging (e.g., random forests) and boosting. Bias-variance trade-off and model complexity will be emphasized. Prerequisite: QMST 3339 with a grade of "D" or better and a minimum 2.0 Overall GPA.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Dif Tui- Business Admin|Topics
Grade Mode: Standard Letter