

Business Information Systems

The BIS major, housed in the Department of Decision and Technology Analytics (DATA), provides students with a strong foundation in cross-functional business processes and the application of information systems to support them. The use of technology and data analytics to improve business performance and effectively support strategic business plans is a major focus of the program. Career opportunities for BIS majors include: business analyst, data analyst, systems analyst, and information systems consultant.

The Business Information Systems major requires three (3) courses and three (3) electives beyond the core requirements of the College of Business. Students are required to take BIS 44, Business Analytics I; BIS 244, Business Analytics II; and BIS 111, Introduction to Information Systems, as part of the business and economics core. Other courses are as follows:

Required Courses

BIS 311	Managing Information Systems Analysis and Design	3
BIS 324	Business Data Management	3
BIS 335	Application Development for Business	3

Elective Courses

Select three of the following:		9
BIS 333	Enterprise Security and Risk Management	
BIS 342	e-Business Enterprise Applications	
or SCM 342	e-Business Enterprise Applications	
BIS 344	Cloud Computing for Business	
BIS 348	Predictive Analytics in Business	
BIS 346	Python Applications for Business	
BIS 352	Business Analytics and Modelling	
BIS 372	Special Topics in Information Systems ¹	
ACCT 311	Accounting Information Systems	
ENTP 304	Technology and Software Ventures	

Total Credits **18**

¹ Courses focusing on different applications of IS in business, including: Data Warehousing and Mining, HR Applications in IS, Numerical Methods of Business Decisions, etc. Consult Professor David Zhang for other related courses.

Business Information Systems Minor

This minor provides an overview of the major technical functions in IS, such as design of systems and the development and management of databases. In addition, the student explores the applications of IS to business problems in one of several electives. This minor is available only to students with a declared major in the College of Business.

This minor provides an overview of the major technical functions in IS, such as design of systems and the development and management of databases. In addition, the student explores the applications of IS to business problems in one of several electives. This minor is available only to students with a declared major in the College of Business degree program or a declared major in the Integrated Business and Engineering (IBE) program (except for IBE students with the CSE major). The minor is not available to students outside of those two degree programs. The minor is not available to students in the CSB program, and the minor is not available to students in the IBE program who major in CSE.

Students must complete all courses for the minor with a grade point average of 2.0 or higher. The Business Information Systems minor consists of the following:

Required Courses (2):

BIS 311	Managing Information Systems Analysis and Design	3
BIS 324	Business Data Management	3
Select one of the following courses:		3

BIS 333	Enterprise Security and Risk Management	
BIS 335	Application Development for Business	
BIS 342	e-Business Enterprise Applications	
BIS 344	Cloud Computing for Business	
BIS 346	Python Applications for Business	
BIS 348	Predictive Analytics in Business	
BIS 352	Business Analytics and Modelling	
Total Credits		9

Courses

BIS 044 Business Analytics I 1.5 Credit

This course covers the basic concepts of data, including the collection, organization, exploration, and understanding of data with an emphasis on complex business data. The focus is on data as an organizational asset, and how data is structured for use in business to optimize business decisions and processes. Students will implement data analytic techniques through hands on programming.

Corequisites: BUS 003

BIS 111 Introduction to Information Systems 3 Credits

This course examines the fundamental role of information systems in supporting and managing all business functions and enabling firms to compete effectively. Both technical and managerial aspects of information systems are introduced. The course integrates technical infrastructure, database concepts, management decision-making, and business process issues critical to the understanding of operational and strategic information systems. It introduces business applications that support accounting, finance, supply chain management, and marketing.

BIS 244 Business Analytics II 1.5 Credit

This course covers techniques and algorithms for creating effective visualizations of complex business data. The emphasis will be on the use of data visualization in business decision making. Students will implement data analysis and visualization through hands on programming and visualization tools.

Prerequisites: BIS 044 and (ECO 045 or MATH 231)

Corequisites: BUS 203

BIS 300 Apprentice Teaching 1-4 Credits

BIS 311 Managing Information Systems Analysis and Design 3 Credits

This course focuses on managing the requirements analysis and system design methodology and techniques for business information systems. Students learn current methods and techniques for system requirement analysis as well as system design, and apply them to real world projects. It covers cost benefit analysis and risk management of business systems development, JAD and structured walkthroughs, structured and object oriented methodologies, and software package evaluation. It emphasizes the factors for effective communication and integration with users and user systems and encourages interpersonal skill development with client users, team members, and others associated with development, operation, and maintenance of the system.

Prerequisites: ACCT 311 or CSB 311 or BIS 111

BIS 324 Business Data Management 3 Credits

This course covers the fundamentals of database management systems (DBMS), including database development, processing, logical and physical design, access, implementation and administration. Students will gain extensive experience in developing data models, creating relational databases, and formulating and executing complex queries. The focus in the course will be on analyzing the connections between data and business organizational information needs and decisions, and understanding the principles of managing organizational data. A project with hands-on experience with a large scale DB is included.

Prerequisites: BIS 111

BIS 333 Enterprise Security and Risk Management 3 Credits

This course explores the management of enterprise IT solutions. The focus is on the management of applications and infrastructure security. Students will be introduced to frameworks for infrastructure management, system administration, critical security principles that enable them to plan, develop, and perform security tasks. The course will address hardware, software, processes, communications, applications, and policies and procedures with respect to enterprise IT Security and Risk Management. These topics are addressed both within and beyond the organization, with attention paid to managing risk and security within audit and compliance standards.

Prerequisites: BIS 111

BIS 335 Application Development for Business 3 Credits

This course provides an introduction to planning, designing, developing and maintenance of high quality computer applications that solve business problems. Students will learn basic systems development and computer programming concepts by designing, coding, and testing in an object oriented computer language. Emphasis will be placed on learning introductory programming concepts, such as declaring variables, control statements, subroutines, functions, and arrays. Additionally, students will develop event-driven graphical user interfaces. Some previous experience with programming helpful but not required.

Prerequisites: BIS 111

BIS 342 (SCM 342) e-Business Enterprise Applications 3 Credits

Introduction to the implications of key information technologies used within and across businesses to conduct e-business. The course covers the functionality of various enterprise applications and their integration: customer relationship management, enterprise resource planning, supply chain management, supplier relationship management, data warehousing and mining, business intelligence, and product lifecycle management.

Prerequisites: BIS 111

BIS 344 Cloud Computing for Business 3 Credits

This course focuses on understanding risk assessment, security guidance, design and deployment of cloud services solutions. Students will demonstrate an understanding of high availability and business continuity, cloud resource costing, deployment management, network design, data storage, security, scalability and elasticity, cloud migration and hybrid architecture. The applied portion of the course gives students hands-on experience designing and deploying cloud environments and services on platforms such as Amazon Web Services.

Prerequisites: BIS 311

BIS 348 Predictive Analytics in Business 3 Credits

The course covers theories and practices in predictive analytics in business. Students will have hands-on experience on analyzing business data for business intelligence and improved business decision making. Includes: key theories, concepts, and models of predictive analytics; and data mining tools to formulate and solve business problems. The course uses data analytics software and real data. Topics include prediction, forecasting, classification, clustering, data-visualization and data reduction techniques. Not available to students who have credit for BIS 448 or BIS 456.

Prerequisites: BIS 111 and (ECO 045 or MATH 012 or MATH 231)

BIS 350 (MGT 350) Project Management 3 Credits

Key processes and tenets of project management including scope, time, cost, quality, human resources, communications, risk, procurement, and integration management. Both technical and behavioral aspects of project management are applied within the context of either IS management, HR management, Supply Chain Process Management, Small Business Management. Topics include: expectations management, change management and consulting engagement management. Introduces both software project monitoring tools and project team collaboration techniques and tools. Must have completion of all other courses in either BIS or Management major.

Prerequisites: BIS 335 and BIS 324

BIS 352 Business Analytics and Modelling 3 Credits

This course covers advanced analytic methods for understanding and solving business problems. The emphasis is on understanding and applying a wide range of modern techniques to specific decision-making situations. Using the programming language R, the course covers advanced topics such as machine learning, text mining, and social network analysis. Upon completion, students will have valuable practical analytical skills to handle large datasets and make business decisions. Credits will not be given for both BIS 352 and BIS 452.

Prerequisites: BIS 111 and (ECO 045 or MATH 012 or MATH 231)

BIS 360 Business Information Systems Practicum 3 Credits

The business information systems practicum provides an opportunity for students to work on an intensive consulting engagement with a business. Students work with client firms on individual or team projects, which focus on information systems activities such as developing requirements, designing, and implementing systems. Students complete written reports and make formal presentations to clients. May not be taken concurrently with MGT 311. Cannot be used to satisfy BIS major or minor requirements.

BIS 371 Directed Readings 1-3 Credits

Readings and research information systems; designed for superior students who have special interest in some topic(s) not covered by the regularly scheduled courses. Written term paper(s) required. Must have preparation in information systems acceptable to program coordinator.

Repeat Status: Course may be repeated.

BIS 372 Special Topics in Information Systems 1-3 Credits

Special problems and issues in information systems for which no regularly scheduled course work exists. When offered as group study, coverage varies according to interests of the instructor and students. Must have preparation in information systems acceptable to program coordinator.

Repeat Status: Course may be repeated.

BIS 373 Business Information Systems Internship 1-3 Credits

Based on a student's work experience, a sponsoring faculty member shall direct readings, projects, and other assignments-including a "capstone report." It should be noted that the work experience (at least 80 hours per credit), by itself, is not the basis for academic credit. The faculty directed activity must be provided concurrent with the work. Course registration and related arrangements, including designating a sponsoring faculty member, must be made in advance of the work engagement. This course must be taken Pass/Fail, cannot be used to satisfy BIS major or minor requirements. Declaration of a BIS major or minor, junior standing, and consent of department required.

Prerequisites: BIS 311

BIS 388 (FIN 388) FinTech Capstone 3 Credits

This course combines experiential learning via a semester long hands-on project with a series of lectures on relevant topics. Students will learn how to apply the information technologies and financial concepts they learned in the other courses to issues in the creation, distribution, servicing, or operations of financial products and services. These issues may include cybersecurity, payment processing, algorithmic trading, credit scoring, blockchain, cryptocurrency, artificial intelligence, machine learning, peer-to-peer lending, online banking, and mobile banking.

Prerequisites: (CSE 012 or CSE 017) and BIS 352 and (BIS 348 or CSE 347 or ISE 364 or ISE 365) and (BIS 324 or CSE 241 or ISE 224) and FIN 330

BIS 396 1-3 Credits

Repeat Status: Course may be repeated.

BIS 423 Management Information Systems 2 Credits

This course examines the role of information systems (IS) and information technology (IT) in the organization. The focus of the course is the organizational uses of IS and IT to compete effectively. Both technical and managerial aspects of information systems are explored. The course includes technical infrastructure, management decision-making, trends and innovations in IS, and business process issues critical to the understanding of operational and strategic information systems.

BIS 446 Python Applications for Business 3 Credits

This class is designed to introduce students to the processes involved in acquiring, cleaning, arranging, analyzing, and visualizing business data using the Python programming language. It will be fast-paced, but assumes only a basic familiarity with coding, and requires no specific expertise in Python to start. We will start with the basics of Python, leveraging the Git version control system, the Spyder IDE, and the Anaconda package manager to get students up and running meaningful code as quickly as possible.

BIS 448 Predictive Analytics in Business 3 Credits

The course covers theories and practices in predictive analytics in business. Students will have hands-on experience on analyzing business data for business intelligence and improved business decision making. Includes: key theories, concepts, and models of predictive analytics; and data mining tools to formulate and solve business problems. The course uses data analytics software and real data. Topics include prediction, forecasting, classification, clustering, data-visualization and data reduction techniques. Not available to students who have credit for BIS 348 or BIS 456.

BIS 452 Business Analytics and Modelling 3 Credits

This course covers advanced analytic methods for understanding and solving business problems. The emphasis is on understanding and applying a wide range of modern techniques to specific decision-making situations. Using the programming language R, the course covers advanced topics such as machine learning, text mining, and social network analysis. Upon completion, students will have valuable practical analytical skills to handle large datasets and make business decisions. Credits will not be given for both BIS 352 and BIS 452.

Prerequisites: BUEC or ECO 045

BIS 456 Business Analytics for Decision Making 3 Credits

Provides students with a theoretical and practical understanding of core data analytics concepts and techniques, and develops hands-on experience in applying these techniques to practical real-world business problems using R software. As an applied course, the emphasis will be less on the inner working of each method and more on when and how to use each technique and how to interpret the results. Not available to students who have credit for BIS 348, 448, 352 or 452.

Prerequisites: MBA 440 or ECO 045 or ECO 427 or BUEC

BIS 458 Data Management for Managers 3 Credits

Covers fundamentals of database management, including database development, processing, logical and physical design, access, implementation and administration, and design and deployment of cloud services solutions. Students will gain extensive experience in developing data models, creating relational databases, formulating and executing complex queries, and understanding cloud services solutions in cloud resource costing, deployment management, network design, data storage, security, scalability and elasticity, cloud migration and hybrid architecture. Hands-on experiences such as such as Oracle Database and Amazon Web Services are included.