

# INFO SYSTEMS & BUS ANALYTICS (ISBA)

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## **ISBA 3710 Database Management Systems (4 semester hours)**

This course is intended for the student who wishes to become more proficient at developing and managing database applications. It is designed to provide an introduction to the conceptual foundations underlying database management systems, with an emphasis on its applications in business and organizations. The course begins with an introduction to the fundamental principles of database design - from data modeling to the actual implementation of a business application. This part of the course will employ lectures describing database theory, as well as hands-on tutorials demonstrating database concepts using a DBMS package. Particular emphasis will be placed on the careful planning and analysis of business needs, which will lead to the appropriate development of an Entity-Relationship Model. Using these principles, each student will design and implement a database application using a DBMS product. The second part of the course will further investigate the principles of relational model, which is the basis for the most popular DBMS products on the marketplace today (i.e., Oracle, SQL Server, MS Access, MySQL). Topics to be studied include relational algebra, Structured Query Language (SQL), and maintaining data integrity in a relational design. In addition, important managerial concerns will be covered including database administration and the management of multi-user databases. Prerequisite: AIMS 2710 or BCOR 2710 or ACCT 3140 with a grade of C (2.0) or higher.

## **ISBA 3720 Systems Analysis and Design (4 semester hours)**

This course introduces established and evolving methodologies for the analysis, design, and development of a business information system. Concepts taught include systems modeling of business processes, requirement analysis, logical and conceptual design, prototype development, testing, and implementation strategies. Upon completion, students should be able to analyze a business problem and design an appropriate solution using a combination of tools and techniques. Prerequisite: AIMS 2710 or BCOR 2710 with a grade of C (2.0) or higher, or consent of instructor.

## **ISBA 3730 Programming for Business Applications (4 semester hours)**

This course is an introduction to programming with an emphasis on its business application capability. Students will learn the basic techniques of programming from concepts to code, including problem analysis, program design, documentation, testing and debugging. The objectives of this course are: making students comfortable with fundamental programming terminology and concepts, including data type, input/output, control statements methods, arrays, strings, and files, along with web, data, and analytics applications; giving students hands-on practical experience with defining and solving problems; and illustrating to students how their programming skills can be translated into working business applications. Prerequisite: BCOR 2710 with a grade of C (2.0) or higher, or permission of instructor.

## **ISBA 3797 Internship (1 semester hour)**

## **ISBA 4715 Developing Business Applications Using SQL (4 semester hours)**

Students looking to work with data must know how to extract data from databases using SQL (Structures Query Language). Students will gain hand-on SQL experience to create databases, construct complex relational queries, develop database programs (views, transactions, triggers, functions, and stored procedures), and write Python code to issue SQL queries for analytics and application development purposes. The SQL syntax covered is supported by many popular databases, such as Oracle, MySQL, Microsoft SQL Server, and PostgreSQL. The course will cover SQL usage for common roles such as a software developer, data scientist, and a business analytics manager. Prerequisites: AIMS 3710 or ISBA 3710 with C- or better, or consent of instructor.

## **ISBA 4740 Financial Modeling and Analytics (4 semester hours)**

This course develops spreadsheet modeling skills and quantitative analysis tools including VBA and Python to support financial decision-making. Hands-on experience in the development of spreadsheet forecasting, simulation, and optimization models for applications in valuation, cash budgeting, and financial planning and portfolio management will be provided as well as techniques for collecting, processing, visualizing, and exploring semi-structured financial data for analysis. Prerequisites: BCOR 3750, and BCOR 3410 or FNCE 3400, all with a grade of C (2.0) or higher.

## **ISBA 4750 Business Web and App Development (4 semester hours)**

This course will focus on the development of front-end web applications for business at enterprise level and creation of CRUD business mobile app by using low-code platforms that are built for speed, collaboration, and control. The purpose of this course is twofold: 1) provide a valuable opportunity for students to create professional grade web applications and publishable mobile app towards building up their technical portfolio, 2) provide a solid foundation for students to meet the real-world challenges in user interface design for technical applications. Prerequisite: ISBA 3710 with a grade of C (2.0) or higher.

## **ISBA 4755 Introduction to Big Data (4 semester hours)**

Ability to process and draw valuable business insights from big data has become central to competitiveness and survival for many industries. However, older and current technologies are not effective in handling big data, and the challenges have pushed the industry to invent fundamentally new ways of capturing, storing, retrieving, processing, and analyzing data. This course introduces students to the fundamental concepts of big data, their sources, and how analytics on big data are designed and implemented. With that foundation, this course will expose students to big data and related new generation platforms and technologies. Students will gain insights into the challenges and techniques of analyzing unstructured data that are generated through various social media and other interactive platforms. Students will also learn the fundamentals of non-relational NoSQL databases, distributed file system, and massively parallel processing used extensively in big data processing. The course will also students to acquire introductory-level proficiencies in hands-on skills involving some big data platforms and tools such as Hadoop, Spark, HBase, etc., or other similar platforms. After completing this course, students will be able to analyze the big data needs and challenges of an organization and recommend choice of tools, technologies, architecture, and implementation strategies needed to capture, process, and turn "Big Data" into actionable business insight. Prerequisites: BCOR 2710; and AIMS 3730 or CMSI 1010, all with a grade of C (2.0) or higher; or consent of instructor.

**ISBA 4760 Data Visualization and GIS (4 semester hours)**

This course will equip students with principles, skills, tools, and techniques in data visualization. First, by using exploratory visualization, students will be able to be familiar with the data and provide insights on the state of the data. Second, through explanatory visualization, students will be able to tell a story about the data, present meaningful reports to non-technical persons, managers, and executives. Third, students will learn about spatial thinking through the use of Geographic Information Systems (GIS). With this tool, students will be able to uncover spatial relationships and perform spatial analyses. Prerequisite: BCOR 2710 with a grade of C or better. ISBA Majors only.

**ISBA 4770 Cybersecurity (4 semester hours)**

This course will present the development and maintenance of the enterprise cybersecurity life-cycle. Students will learn how to design a comprehensive and resilient cybersecurity program in alignment with business objectives in a hands-on lab and project-based learning environment. Other topics include implementation and management of security operations, security assessments and remediation of deficiencies, security intelligence, and incident response. Prerequisite: BCOR 2710 with a grade of C or better. ISBA Majors only.

**ISBA 4775 Network Cloud Computing (4 semester hours)**

This course will introduce students to the fundamentals of networking and cloud computing. Students will configure networks and cloud computing services to address common information systems and business analytics needs through hands-on exercises. The course will start with networking fundamentals covering topics such as networking hardware, the OSI Model, TCP/IP, and various network protocols, while addressing each topic's security considerations. The second half of the course will leverage the student's networking foundation to explore and deploy the most commonly used cloud services, including compute, storage, databases, and serverless. Students will be able to host cloud-based applications and know the difference between the various cloud services available.

**ISBA 4790 Machine Learning (4 semester hours)**

Machine Learning (ML) techniques, tools, and algorithms are extensively used in providing "predictive analytics" insight to businesses. In this course, students will acquire skills to build predictive models from a given dataset to answer certain predictive business questions and learn how to deploy such models in an IT environment. During this course, students will dive deep into the inner workings of a number of supervised and unsupervised ML algorithms, learn their computer implementations in platforms such as Python, R, or other similar technologies. Students will gain knowledge of the comparative strengths and weaknesses, and understand how to choose specific algorithms to solve different types of predictive problems. They will also learn topics such as feature engineering, dimensionality reduction, model performance evaluation, performance boosting and tuning. Prerequisites: BCOR 2710, BCOR 3750, and ISBA 3730 or CMSI 1010, all with a grade of C (2.0) or higher; or consent of instructor.

**ISBA 4796 Capstone Proposal Development (1 semester hour)**

Prerequisite: BCOR 2710 with a grade of C (2.0) or higher.

**ISBA 4797 Capstone Project (4 semester hours)**

This course presents a student with a challenge and an opportunity to build a portfolio-worthy project to solve a real business problem by integrating business and technical knowledge and skills. For employers, it represents a clear snapshot of a student's understanding of the subject matter and their ability to identify a meaningful project and exercise initiative. It also presents students with first-hand experience to develop project management, teamwork, and communication skills critical for an IT career. A project proposal and instructor consent are required. Prerequisites: ISBA 3710, ISBA 3750, and (ISBA 3730 or CMSI 1010), and (ISBA 3720 or 4796), and (ISBA 3720 or one 4-unit elective), all with a grade of C (2.0) or higher. Credit for ISBA 4796.

**ISBA 4798 Special Studies (1-4 semester hours)**

**ISBA 4799 Independent Studies (1-4 semester hours)**