# INFORMATION SYSTEMS - BUS (INFS)

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**INFS 247 Business Information Systems (3 Credit Hours)**
Focuses on using information technology to support business processes. The purpose and composition of information systems, the utilization of technology and hands-on experience in developing microcomputer business applications with productivity tools (Microsoft Excel and Access).
*Course equivalencies:* INFS247/ISOM/MGSC247/ACINF247
*Outcomes:*
Understanding of using information technology to support business processes, and of developing business spreadsheet and database applications

**INFS 247H Business Information Systems - Honors (3 Credit Hours)**
Focuses on using information technology to support business processes. The purpose and composition of information systems, the utilization of technology and hands-on experience in developing microcomputer business applications with productivity tools (Microsoft Excel and Access). Restricted to SBA honors students.
*Course equivalencies:* INFS247/ISOM/MGSC247/ACINF247
*Outcomes:*
Understanding of using information technology to support business processes, and of developing business spreadsheet and database applications

**INFS 336 Global Perspectives on Digital Business (3 Credit Hours)**
*Pre-requisites:* Minimum grade of "C-" in INFS 247
This course will present topics related to managing information systems projects and digital business from a global perspective. Project management issues such as analyzing stakeholders, defining expectations, defining project deliverables, analyzing scope, collecting requirements, developing schedules, and mitigating risk, will be covered. Also, variety of digital business issues, such as digital business models, disruptive forces, and digital strategies will be covered from a global perspective.
*Outcomes:*
Understanding of concepts and steps related management of digital business project in a global environment; Understanding of general and global digital business concepts and issues

**INFS 343 Business Analytics (3 Credit Hours)**
*Pre-requisites:* Sophomore standing; C- or better in (ISSCM 241 or ISSCM 241H or STAT 103), (INFS 247 or INFS 247H), and one of the following: MATH 110, MATH 118, MATH 130, MATH 131, or MATH 161
This course covers basic principles in data modelling, and turning big data into intelligent actionable insights. Through the use of real business case studies and lab sessions students will develop a comprehensive, innovative and practical approach to data analytics that enables them to solve diverse and complex business problems.
*Course equivalencies:* BSAD343/BSAD343H
*Outcomes:*
Explain core design concepts, appraise various technological solutions, determine proper analytics methods, integrate data visualization, and make a compelling presentation of a novel use case depicting current market trends

**INFS 343H Business Analytics - Honors (3 Credit Hours)**
*Pre-requisites:* Open to students in the Quinlan Honors Program
This course covers basic principles in data modeling, and turning big data into intelligent actionable insights. Through the use of real business case studies and lab sessions students will develop a comprehensive, innovative and practical approach to data analytics that enables them to solve diverse and complex business problems. Requires C- or better in ISSCM 241H or ISSCM 241 or STAT 103, INFS 247 or INFS 247H, and one of the following: MATH 110, MATH 118, MATH 130, MATH 131, or MATH 161.
*Course equivalencies:* BSAD343/BSAD343H
*Outcomes:*
Explain core design concepts, appraise various technological solutions, determine proper analytics methods, integrate data visualization, and make a compelling presentation of a novel use case depicting current market trends

**INFS 346 Database & Data Warehousing Systems (3 Credit Hours)**
*Pre-requisites:* Sophomore Standing, minimum grade of "C-" in INFS/ISSCM 247
Covers current concepts in database theory and use. The course teaches design, implementation, and utilization of relational database management systems by covering the processes, tools, and methodologies such as business requirement collection, ER modeling, relational modeling, normalization, SQL, and MS Access.
*Course equivalencies:* ISOM346 / MGSC346
*Outcomes:*
Students will be able to demonstrate understanding of how to effectively develop and use business database system

**INFS 347 Systems Analysis & Design (3 Credit Hours)**
*Pre-requisites:* Sophomore Standing, minimum grade of "C-" in INFS 247
This course studies methods for analyzing, developing and implementing business information systems. Stages of the systems development life cycle are explored in depth. Tools and techniques for structured and object-oriented analysis and design are discussed.
*Outcomes:*
Understanding of the development and implementation of business information systems

**INFS 348 Advanced Data Analytics and AI (3 Credit Hours)**
*Pre-requisites:* Minimum grade of C- in INFS 346 and INFS 343
This course focuses on extracting insights from complex datasets and progresses from data mining and R principles to data transformation and data mining techniques. Using deep learning and large language models, it addresses challenges in AI analytics, emphasizing ensemble learning techniques, model evaluation, and the handling of big data.
*Course equivalencies:* ISOM348 / MGSC348
*Outcomes:*
To be able to effectively use technologies such as Hadoop (Map Reduce) & R for solving data-dependent business problems of varying levels of complexity

**INFS 360 Data Visualization & Business Intelligence (3 Credit Hours)**
*Pre-requisites:* Minimum grade of "C-" in INFS 346
The amount of data that our world generates is growing at a torrid pace. Sifting through & making sense of these humongous mountains of data is crucial to ensuring business growth, success and to making scientific discoveries & advancements. Data visualization plays an important role in this process.
*Outcomes:*
Students will be able to process & visualize large amounts of data in order to enable efficient & effective analysis using industry standard software

**INFS 362 User Experience (UX) and Biometrics (3 Credit Hours)**
This experiential and research-focused course explores the newest developments in the field of user experience (UX) & biometrics (e.g., collecting and analyzing human behavior data through eye tracking, galvanic skin response, facial expression, voice, and brain activity) and introduces various methods used in cutting-edge research laboratories to study human insight in business contexts. Theoretical UX concepts and practical skills in biometric data collection and analysis will be explored using the latest academic research and hands-on work with biometric hardware, software, and data. Students will complete and present the original human subject research project (team-based and with IRB approval) using biometric trackers and biosensors. The research project will be documented in the format of a full academic article.
This course satisfies the Engaged Learning requirement.
*Outcomes:*
Students will be able to communicate the value of User Experience in design; Describe the value of human insights through biometric data; Critically evaluate biometric data-focused research studies; Design and implement a biometric data-focused research study; Analyze and interpret human insights through fundamental biometric data such as gaze, facial expressions, and galvanic skin response; Develop proficiency in working with leading biometric trackers/biosensors and software platform; Write a complete empirical academic article using biometric data

**INFS 394 Programming in Python (3 Credit Hours)**
*Pre-requisites:* Junior standing and a minimum grade of C- in INFS 346
This course focuses on how to effectively use the Python computer programming language to support decision making in business. We will particularly focus on using Python for manipulating and analyzing data. In addition to covering the concepts of programming, this course covers working with external data, debugging code and developing user interfaces.
*Outcomes:*
To learn how to develop computer programs in the Python programming language; To understand the process of debugging code to resolve errors; To read data from external files including from an external database using embedded SQL within Python code

**INFS 395 Independent Study in Information Systems (1-3 Credit Hours)**
Independent study is in-depth research or reading, initiated by the student and jointly developed with a faculty member in a specialized area of Information Systems not otherwise covered by departmental course offerings. Variable Credit. May count for Information Systems major or minor. Permission of Assistant Dean required.

**INFS 397 VBA Programming with MS Office (3 Credit Hours)**
*Pre-requisites:* Junior Standing, minimum grade of "C-" in INFS 346
This course focuses on how to effectively use Microsoft Office's built-in programming language, Visual Basic for Applications (VBA), to build models, primarily in Excel. We will cover issues that facilitate the construction of robust and readily understandable models in the VBA language. Starting with basic modeling functions, the course will progress through complex modeling skills. This course assumes that you are familiar with Basic Excel operations.
*Outcomes:*
By the end of this course, the student should be able to: build models using Excel built-in functions, build, customize and store Excel macros, design and build accurate, robust models with VBA, build custom VBA procedures, and create user-defined financial functions in VBA

**INFS 399 Special Topics in Information Systems (1-3 Credit Hours)**
Special topics are scheduled classes offered on an ad hoc basis. Specific titles, prerequisites and content will vary.

**INFS 443 Business Analytics (3 Credit Hours)**
Business analytics is the practice of using methodically collected data to drive decisions about business and in business applications. The goal of the course is to introduce students to the current approaches, tools, and techniques involved in this practice. Because many topics and concepts in business analytics are best learned through hands-on work, time will be spent obtaining, processing, analyzing and visualizing data that pertain to different business cases. Students will use R, arguably the most popular analytical software used by data scientists. During this course, students will learn to use R, as well as gain and help improve business insight through data-driven analytics. Restricted to Graduate School of Business students.
*Outcomes:*
Explain the key factors differentiating business intelligence from business analytics; Frame a problem in a business analytics context to drive insightful decisions and gain the competitive edge

**INFS 491 Managerial Statistics with Artificial Intelligence (AI) (3 Credit Hours)**
*Pre-requisites:* Graduate School of Business student
This course examines the integration of statistical methods with artificial intelligence (AI) techniques to analyze and interpret complex data. Students will study key statistical concepts, including descriptive statistics, random variables, probability distributions, estimation, hypothesis testing, regression, correlation analysis, and model building. AI-driven approaches will be introduced for various topics. Emphasis is placed on using statistical software and AI to facilitate data analysis and address real-world problems effectively.
*Course equivalencies:* ISOM491 / MGSC491
*Outcomes:*
Students will gain a high-level understanding of common statistical tools used in AI and machine learning algorithms and they will be able to derive conclusions from statistical studies; Students will be able to describe data using visual and numerical summaries, analyze and interpret data effectively, perform estimation and hypothesis testing, develop and evaluate statistical models such as regression, apply statistical software for data analysis, and present statistical findings and AI results clearly and accurately

**INFS 492 Database Systems (3 Credit Hours)**
This course uses database systems as the focus for studying concepts of data modeling and data manipulation. Procedures for creating, managing, sorting, and processing data are discussed. Concepts of relational database methods are covered as well as the issues that arise in managing information in a database and using it to support business processes.
*Course equivalencies:* ISOM492 / MGSC492
*Outcomes:*
Understanding the development and use of business database systems

**INFS 492E Business Intelligence/Data Warehousing (1.5 Credit Hours)**
Enrollment is restricted to students in the Executive MBA Program. Explores concepts of data warehousing and business intelligence from a managerial perspective.
*Course equivalencies:* INFS600E/INFS492E

**INFS 493 Database Analytics (3 Credit Hours)**
*Pre-requisites:* INFS 492 This course focuses on practical methods for in-database data preparation and manipulation to extract analytical insights out of a large or big data repository
The concept of big data, distributed computing frameworks, and massively parallel processing databases are also covered. Students will become proficient using open source databases, performing extensive advanced SQL programming, writing scripts and manipulating strings, numbers, data, etc. within a database.
*Outcomes:*
Implement Advanced Data Queries: Conduct advanced searches, hierarchical queries, and implement range-based filtering to address complex data analysis requirements; Master Advanced SQL Techniques: Develop expertise in advanced SQL programming, including \\nstring manipulation, numerical calculations, date handling, and metadata queries; Analyze and Prepare Data for AI: Utilize in-database data preparation techniques to transform raw data into actionable insights, a critical step for AI model development and implementation

**INFS 493E Strategic Use of Information Technology (1.5 Credit Hours)**
Enrollment is restricted to students in the Executive MBA Program. Focuses on the use of information technology for competitive advantage, including the management of information as a corporate resource, and information systems planning and its relationship to corporate planning.
*Course equivalencies:* ISOM601E / INFS601E/INFS493E

**INFS 494 Applied Data Mining and Artificial Intelligence (AI) (3 Credit Hours)**
Data Mining involves the search for patterns in large quantities of data using techniques such as clustering, decision trees, neural networks, and association analysis. Machine learning, the process of using mathematical models of data to help a computer learn without direct instruction, an important application of artificial intelligence (AI), is also introduced.
*Course equivalencies:* X-CSIS494/INFS494
*Outcomes:*
The student will be able to build models using an industry-standard package and interpret the results; The student will be able to use AI-enabled tools to discover and extract implicit but potentially useful information from data

**INFS 495 Forecasting Methods with Artificial Intelligence (AI) (3 Credit Hours)**
*Pre-requisites:* Graduate School of Business Student and ISSCM 491 or ISSCM 402N
Techniques of forecasting and model building are introduced. Methods covered are simple and multiple regression, introduction to time series components, exponential smoothing algorithms, and AIRMA models - Box Jenkins techniques. Business cases are demonstrated and solved using the computer.
*Course equivalencies:* ISOM495 / MGSC495
*Outcomes:*
Students will be able to forecast business and economic variables to enhance business decisions; Students will learn how AI enhances forecasting techniques by uncovering complex patterns, automating model optimization, and improving forecast accuracy; Students will be equipped with the skills to create advanced, AI-augmented forecasting models, making them invaluable assets in data-driven decision-making environments

**INFS 496 Systems Analysis and Design (3 Credit Hours)**
Provides a core set of skills for planning, managing and executing systems analysis and design processes in e-business and Web-based environments. Topics typically include project initiation and planning, methods used in the determination of information requirements, prototyping, techniques used in systems design, testing and implementation strategies.
*Course equivalencies:* X-INFS496/CSIS496
*Outcomes:*
Understanding of the development and implementation of business information systems

**INFS 499 Independent Study (3 Credit Hours)**
Independent study is in-depth research or reading, initiated by the student and jointly developed with a faculty member, into a specialized area of information systems not otherwise covered by department course offerings.

**INFS 590 Global Strategy and Data (3 Credit Hours)**
This course introduces the student to economic and business practices of a foreign country using the analysis of data, and on-site experiences. We will focus on business strategies, impediments, and challenges in light of the culture, politics, history and institutions of a selected country. We will interact with a variety of local people such as small business owners, firm managers, economists, journalists, and students, in order to inform our understanding and analysis.
*Course equivalencies:* MGMT590/ISOM590
*Outcomes:*
Students will gain knowledge and analytical skills that can assist them in facing the challenges of conducting business in global locations

**INFS 592 Data Visualization (3 Credit Hours)**
*Pre-requisites:* INFS 492
The amount of data that our world generates is growing at a torrid pace. Sifting through & making sense of these humongous mountains of data is crucial to ensuring business growth, success and to making scientific discoveries & advancements. Data visualization plays an important role in this process.
*Outcomes:*
Students will be able to process & visualize large amounts of data in order to enable efficient & effective analysis using industry standard software

**INFS 596N Data Driven Decision Making (3 Credit Hours)**
*Pre-requisites:* Restricted to School of Business graduate degree students
Perhaps one of the biggest challenges facing organizations is bridging the gap between those who have technical expertise in information systems and those who are managerial decision makers. This course builds on the decision strategy course to help address that challenge.
*Course equivalencies:* INFS596N/ISSCM596B
*Outcomes:*
Understand the sources and limitations of data; Understand how databases organize data sets and the use of SQL to extract data; Increase facility with spreadsheets; Expose students to the issues that arise between those who provide data and those who use data to make business decisions

**INFS 600E Business Intelligence & Data Warehousing (1.5 Credit Hours)**
Explores concepts of data warehousing and business intelligence from a managerial perspective.
*Course equivalencies:* INFS600E/INFS492E

**INFS 604E Business Data Analytics - Infrastructure (1.5 Credit Hours)**
The course covers concepts related to data organizing and database modeling, and the managerial issues related to the design, implementation, and utilization of systems that support operational data use and provide infrastructure for business data analytics. Enrollment limited to EMBA Cohort.
*Outcomes:*
Students will learn how to gather, understand, manage, and act on information stored in databases, data warehouses, and Big Data repositories

**INFS 605E Business Data Analytics - Application (1.5 Credit Hours)**
The course covers the effective uses and applications of data analytics; including On-Line Analytic Processing/Business Intelligence, data mining techniques and their particular applications and data visualizations methods and tools. Enrollment limited to EMBA Cohort.
*Outcomes:*
Students will learn how business data analytics is applied to create competitive edge and business opportunities and how to understand and manage business data analytics applications projects

**INFS 691 Principles of Analytic Programming (3 Credit Hours)**
*Pre-requisites:* INFS 443
This course will focus on the R language and will build on the introduction from INFS 443.
*Outcomes:*
Students will learn to manipulate data, write functions and scripts for repeatable analysis, build models, and perform data analysis tasks

**INFS 791 Programming for Business Decision Making (3 Credit Hours)**
This course focuses on how to effectively use a computer programming language to support decision making in business. Examples include using Visual Basic for Applications (VBA) to create applications within Microsoft Excel or using Python for manipulating and analyzing data. In addition to covering the concepts of programming using the specified language, this course covers developing user interfaces, working with external data and debugging code. By the end of this course, the student will be able to build custom procedures and create user-defined functions in the programming language used.

**INFS 795 Ethics and Data Analytics (3 Credit Hours)**
The rapid advancement in technology necessitates an equally rapid advance in the ethics of data analytics. We will explore ethical questions in this field through the use of business case studies. We will also look at examples of ethical codes of conduct.
*Outcomes:*
Students will evaluate following ethical considerations: how data is collected, how it is interpreted, how it is applied, and with whom it is shared

**INFS 796 Data Warehousing (3 Credit Hours)**
*Pre-requisites:* INFS 492 Outcomes: Students will learn how data warehouses are used to help managers successfully gather, analyze, understand and act on information stored in data warehouses
The components and design issues related to data warehouses and business intelligence techniques for extracting meaningful information from data warehouses are emphasized. Oracle tools will be used to demonstrate design, implementation, and utilization issues.
*Course equivalencies:* X-ISOM796/MGSC796/CSIS796

**INFS 797 Applications of Visualization (3 Credit Hours)**
Students will explore human perception and cognition, the use of best design practices, and interacting/storytelling with data.
*Outcomes:*
This course will develop a vocabulary and framework for discussing, critiquing, assessing, and designing visual displays of quantitative data

**INFS 798 AI Product Management (3 Credit Hours)**
This 10-week intensive course aims at mastering the end-to-end process of discovering, designing, developing, delivering, and managing products in context to data, machine learning and artificial intelligence. The course concentrates on strategic thinking and tactical implementation of data driven products and provides skills needed to become a successful product manager.
*Outcomes:*
Apply product management principles to ideate and develop innovative AI tools and solutions; Utilize product management strategies to guide the development of AI tools that support data-driven decision-making; Prototype and validate AI solutions, using product management methodologies to efficiently design, test, and iterate AI prototypes for real-world applications

**INFS 799 Special Topics in Information Systems (3 Credit Hours)**
Scheduled classes are offered on an ad hoc basis. Specific titles, prerequisites and content will vary.
*Outcomes:*
Students will be able to demonstrate understanding of specialized topics not otherwise covered by department regular course offerings