INFORMATION SYSTEMS AND TECHNOLOGY (IN/IT)

IN500: Survey of Modern Data Analytics
In this course, you will examine current methods and tools for the collection, storage, processing, and analysis of data in modern organizations. You will study industry-relevant technologies such as Hadoop; MapReduce; structured, semi-structured, and unstructured data sources; distributed data systems; relational and NoSQL databases; and analytics software platforms. Data selection, retrieval, and formatting are also covered. Additionally, you will examine the V's of Big Data - volume, velocity, variety, veracity, valence, and value - and will learn how each impacts data collection, monitoring, storage, analysis, and reporting.
Quarter Credit Hours: 4 | Prerequisite: None

IN501: Fundamentals of Computer Programming
This course is designed to teach the fundamentals of computer programming. You will learn about data types, variables, decisions, iteration, input/output, and data structures. You will use a variety of libraries commonly used in data analytics. Also, you will learn about algorithms and how to create them. The Python programming language is used to apply the fundamentals learned in this course. Secure programming techniques are also emphasized throughout the course.
Quarter Credit Hours: 4 | Prerequisite: None

IN502: Python Statistical Tools
This course is designed for you to use Python and R and additional add-on tools to analyze multiple datasets using standard statistical methods. Standard statistical methods include descriptive statistics, linear and logistic regression, and probability, including Bayes theorem. The datasets used will be of varying sizes and multiple questions will be addressed related to the datasets.
Quarter Credit Hours: 4 | Prerequisite: None

IN503: Introduction to Machine Learning
This course provides an introduction to the broad field of machine learning. You will gain hands-on experience building machine learning models using industry-standard python libraries. The course also covers important topics, such as data preparation pipelines for downstream machine learning.
Quarter Credit Hours: 4 | Prerequisite: IN504 and MM555

IN504: Advanced Applications of Python
This course furthers your ability to examine large datasets and answer significant questions related to these datasets. You will delve deeper into the use of Python and the related add-ons to resolve more complex inquiries and problems. You will learn object-oriented concepts in Python, explain and apply analytical libraries, and review how to integrate Python programs into the technical ecosystem.
Quarter Credit Hours: 4 | Prerequisite: None

IN505: Security for Analytics
This course focuses on the security issues that are unique to big data and analytics. Some of these security issues include distributed data and distributed processing, non-relational databases that are designed more for flexibility than security, broad access to data required, and big data processing in cloud environments. You will explore the data security considerations related to storing and mining big data and will learn methods to properly secure big data. Emphasis will also be paid to securing data warehouses and data lakes.
Quarter Credit Hours: 4 | Prerequisite: None

IN505M1: Security Issues for Data Analytics
Identify security-related issues in big data system architecture.
Quarter Credit Hours: 1 | Prerequisite: None

IN505M2: Big Data Security and Privacy Risks
Analyze security and privacy risks in big data analytics systems and big data processing.
Quarter Credit Hours: 1 | Prerequisite: None

IN505M3: Managing Security Risks in Data Analytics
Evaluate methods to prevent or minimize security risks in data analytics systems.
Quarter Credit Hours: 1 | Prerequisite: None

IN505M4: Protecting Big Data
Apply techniques to protect big data during processing.
Quarter Credit Hours: 1 | Prerequisite: None

IN506: Data Visualization and Knowledge Representation
This course integrates data modeling, aggregation, selection, mapping to graphical representations, and visual presentation to enable interpretation of data and problem-solving. A variety of datasets will be used to answer questions and report the information appropriately. You will examine strengths and weaknesses of various visual choices and will think critically about design choices, such as color schemes, shape and chart/graph types, and presentation options. Industry-wide tools are used to prepare data analysis to make thoughtful decisions.
Quarter Credit Hours: 4 | Prerequisite: None

IN507: Data Curation
In this course, you will examine the processes of extracting, transforming, and loading (ETL) data from multiple, seemingly unrelated datasets. You will examine the new data to identify and discover new context and new meanings from the resultant datasets. Additionally, you will explore the integration of multi-sourced and independent structured and semi-structured data for analytics. Topics include ETL techniques, transactional databases, data warehouses, data marts, and semi-structured and unstructured data sources.
Quarter Credit Hours: 4 | Prerequisite: IN506

IN508: Advanced Machine Learning and Artificial Intelligence
This course surveys algorithms used in machine learning packages, tree-based methods, clustering, and neural networks. You will complete a small project applying, and modifying as necessary, one of these algorithms to a dataset, finishing with a presentation of the project. The focus will be more in-depth than simply applying the packages, such that you understand the pseudocode or math used to build the algorithm.
Quarter Credit Hours: 4 | Prerequisite: IN503

IN509: Advanced Deep Learning
This course provides an overview of deep learning. You will gain hands-on experience building deep learning models using industry-standard Python libraries.
Quarter Credit Hours: 4 | Prerequisite: IN508

IN510: Secure Software Design
This course will introduce you to secure software design principles used to develop secure software applications. You will learn to incorporate security into all phases of the development life cycle. Additionally, you will explore well-known software algorithms that can be used when designing software.
Quarter Credit Hours: 4 | Prerequisite: Prior degree in IT-related field and 2 years programming/software development experience

IN511: Secure Coding
This course will introduce you to secure coding practices. You will learn how to avoid coding vulnerabilities and how to implement security controls. You will be introduced to a variety of software vulnerabilities resulting from insecure coding. You will develop various types of programs demonstrating secure coding standards and will examine existing code to detect and fix vulnerabilities.
Quarter Credit Hours: 4 | Prerequisite: IN510

IN512: Advanced Secure Coding
In this course you will learn advanced secure coding techniques. This includes advanced programming concepts and secure coding standard usage. You will also learn to use secure coding practices to prevent various types of vulnerabilities.
Quarter Credit Hours: 4 | Prerequisite: IN511

IN513: System and Security Testing
This course introduces you to software testing techniques. This includes techniques to adequately verify the security of software applications. Some topics covered will be unit testing, functional testing, regression testing, load testing, vulnerability scanning, and penetration testing.
Quarter Credit Hours: 4 | Prerequisite: IN512

IN514: Secure Development and Operations - SecDevOps
This course introduces you to the collaboration of development and operations teams and how the integration of security in all facets of the software lifecycle results in secure development and operations (SecDevOps). By implementing SecDevOps in an organization, you will help to deliver software that is more secure and of quality. In addition, you will learn about supply chain analysis and procurement and how this plays a part in delivering secure software systems.
Quarter Credit Hours: 4 | Prerequisite: IN513

IN515: AWS Academy Cloud Foundations
Amazon Web Services (AWS) Academy Cloud Foundations is intended to help you seek an overall understanding of cloud computing concepts, independent of specific technical roles. It provides a detailed overview of cloud concepts, AWS core services, security, architecture, pricing, and support.
Quarter Credit Hours: 4 | Prerequisite: None

IN516: AWS Academy Cloud Architecting
Amazon Web Services (AWS) Academy Cloud Architecting covers the fundamentals of building information technology (IT) infrastructure on AWS. The course is designed to teach solutions architects how to optimize their use of the AWS Cloud by understanding AWS services and how they fit into cloud-based solutions. Although architectural solutions can differ depending on the industry, type of application, and size of the business, this course emphasizes best practices for the AWS Cloud that apply to all of them. It also recommends various design patterns to help you think through the process of architecting optimal IT solutions on AWS. Throughout the course, you will explore case studies that showcase how some AWS customers have designed their infrastructures and the strategies and services that they have implemented. Finally, this course provides opportunities for you to build a variety of infrastructures through a guided, hands-on approach.
Quarter Credit Hours: 4 | Prerequisite: None

IN517: AWS Academy Cloud Developing
Amazon Web Services (AWS) Academy Cloud Developing is designed to help you gain technical expertise in development using cloud technologies and prepare you to take the AWS Certified Developer - Associate exam. The curriculum is delivered through instructor-led classes, knowledge assessments, and hands-on labs. You will also have access to course manuals, online knowledge assessments, a free practice certification exam, and a discount voucher for the certification exam. While the course may provide you with the knowledge necessary to sit for an examination, the University cannot guarantee your eligibility either to take an exam or to become certified.
Quarter Credit Hours: 4 | Prerequisite: None

IN518: AWS Academy Data Analytics Lab
Amazon Web Services (AWS) Academy Data Analytics is a series of lab exercises that teach you how to conduct big data analysis with practical, real-world examples. You will learn how to analyze extremely large data sets and create visual representations of that data using a case-study approach.
Quarter Credit Hours: 4 | Prerequisite: None

IN519: AWS Academy Cloud Operations
Amazon Web Services (AWS) Academy Cloud Operations is designed to prepare you to pursue entry-level DevOps, support, and cloud operations roles. It will also help prepare you to take the AWS SysOps Administrator - Associate exam. Emphasizing best practices in the AWS Cloud and recommended design patterns, this course will teach you how to solve problems and troubleshoot various scenarios. The course will show you how to create automatable and repeatable deployments of networks and systems on AWS and covers specific AWS features and tools related to configuration and deployment. Through case studies and demonstrations, you will learn how some AWS customers design their infrastructures and implement various strategies and services. You will also have the opportunity to build a variety of infrastructures via guided, hands-on activities. While the course may provide you with the knowledge necessary to sit for an examination, the University cannot guarantee your eligibility either to take an exam or to become certified.
Quarter Credit Hours: 4 | Prerequisite: None

IN520: Foundations of Software Quality Assurance
In this course, you will focus on theoretical and practical concepts and how they pertain to Software Quality Assurance (SQA). You will gain an in-depth understanding of a software quality engineer's role and responsibilities to help equip yourself to advocate for superior software standards in a dynamic tech world.
Quarter Credit Hours: 4 | Prerequisite: Completion of an undergraduate degree or certification in a software or quality assurance-related field

IN521: Advanced Techniques in Software Quality Assurance and Security
In this course, you will be equipped with the necessary knowledge and skills to deliver high-quality software applications. In addition, you will delve into the intricate facets of software quality assurance. You will also focus on support processes, third-party management, and audit/inspection protocols.
Quarter Credit Hours: 4 | Prerequisite: IN520

IN522: Introduction to Artificial Intelligence I
This course provides a graduate-level introduction to artificial intelligence (AI), broadly defined as any method that enables intelligent behavior in computers. Topics may include AI techniques, machine learning, deep learning, natural language processing, and probability. The course includes basic training in AI areas and will cover technical concepts, intuitions, and algorithms. The course expects knowledge of linear algebra, probability distributions, random variables, and Python programming.
Quarter Credit Hours: 4 | Prerequisite: Prior degree in IT-related field and 2 years Python programming development experience

IN523: Introduction to Artificial Intelligence II
In this course, you will learn about machine learning, deep learning, natural language processing, and probability. The course will delve into technical aspects, underlying principles, and algorithms used in artificial intelligence (AI), along with providing basic training in these areas and basic training in AI research.
Quarter Credit Hours: 4 | Prerequisite: IN522

IN525: Applied Mathematics for Data Science
This course provides an overview of mathematics topics relevant to artificial intelligence (AI) from a variety of mathematics disciplines, such as calculus, linear algebra, probability, and statistics. You will also have the opportunity to apply techniques using Python.
Quarter Credit Hours: 4 | Prerequisite: IN504

IN530: Introduction to Blockchain
This course introduces you to the fundamentals of blockchain technology. This includes decentralized networks, the distributed ledger, and trust models that define a blockchain. You will learn how cryptography is essential to blockchain technology. Also, you will explore applications for blockchain, like cryptocurrency and smart contracts. Finally, you will analyze the impact of blockchain on industries such as finance.
Quarter Credit Hours: 4 | Prerequisite: IT543

IN531: Blockchain Technologies and Applications
In this course, you will learn about blockchain networks, payment systems, clients, application programming interfaces (APIs), and development environments. You will analyze Bitcoin, Ethereum and alternative cryptocurrency applications, non-fungible tokens (NFTs), and smart contracts. Finally, you will apply what you learned by designing a blockchain-based application.
Quarter Credit Hours: 4 | Prerequisite: IN530

IN532: Blockchain Application Development (dApps)
In this course, you will dive into the world of decentralized applications (dApps) to access blockchain features and services. You will learn about designing, implementing/coding, testing, and deploying a decentralized application controlled by a smart contract's logic. You will gain hands-on experience by using object-oriented programming skills.
Quarter Credit Hours: 4 | Prerequisite: IN531

IN554: Introduction to Critical Infrastructure Security
This course introduces definitions and core principles relevant to critical infrastructure cybersecurity. The course will explore the National Infrastructure Protection Plan as a framework for understanding critical infrastructure security. The sixteen sectors of critical infrastructure, as defined by Cybersecurity and Infrastructure Security Agency (CISA), will be explored in terms of specific threats, vulnerabilities, and mitigations. The 16 sectors are Chemical; Commercial Facilities; Communications; Critical Manufacturing; Dams; Defense Industrial Base; Emergency Services; Energy; Financial Services; Food and Agriculture; Government Facilities; Healthcare and Public Health; Information Technology; Nuclear Reactors, Materials, and Waste; Transportation Systems; and Water and Wastewater Systems. Industrial Control Systems (ICS) and Operational Technology will also be explored in-depth. The course will answer who the actors and agents are in critical infrastructure and what security technologies and processes are needed to protect critical infrastructure. You will learn how to perform a cybersecurity vulnerability assessment for critical infrastructure.
Quarter Credit Hours: 4 | Prerequisite: None

IN555: Statistics for the IT Professional
This course provides you with an introduction to statistics. Topics include descriptive statistics, slopes and lines, correlation and linear regression, probability, confidence testing and hypothesis testing, and Chi-square inference and ANOVA. You will use software to develop skills in data-based problem solving.
Quarter Credit Hours: 4 | Prerequisite: None

IN560: Open Source Operating System Administration
This course provides you with comprehensive coverage of topics related to the administration of an open-source operating system, including distributions, installation, administration management, cloud technologies, networking, and security.
Quarter Credit Hours: 4 | Prerequisite: None

IN561: Cloud Computing
This course provides you with a wide overview of vendor-independent cloud computing technology concepts and methods. Specific topics include cloud architecture and design, cloud security, deployment, operations and support, and cloud troubleshooting.
Quarter Credit Hours: 4 | Prerequisite: None

IN562: Cyber Threat Intelligence
In this course, you will determine the benefits of threat intelligence within an organization. You will examine the intelligence cycle to include planning, collecting, processing and exploitation, and dissemination and feedback. Your intelligence findings will enable you to illustrate a threat actor's targets, motives, and attack behaviors and to formulate a cyber threat intelligence program to help an organization be more proactive with security situations.
Quarter Credit Hours: 4 | Prerequisite: None

IN563: Secure Supply Chain
Supply chains are increasingly complex, interconnected, and dependent on digitization and modern technologies, exposing them to unique cybersecurity risks and the need for new regulatory requirements. This course explores domestic and global supply chain evolution and how this evolution affects supply chain cybersecurity. You will analyze real-world supply chain security scenarios, evaluate threats, and recommend mitigation approaches.
Quarter Credit Hours: 4 | Prerequisite: None

IN564: Critical Infrastructure Sector Security
There are 16 critical infrastructure sectors that are considered so vital to the U.S. that the destruction of assets, systems, and networks in these sectors would debilitate national economic security, cybersecurity, national public health and safety, or all potential combinations. This class will take a case-study approach to cover the 16 critical infrastructure sectors. The course will focus on identifying and mitigating risks and threats within each sector and developing strategies to enhance their resilience.
Quarter Credit Hours: 4 | Prerequisite: None

IN565: Critical Urban Infrastructure Security
This course introduces cybersecurity for smart cities and critical urban infrastructure. You will assess risks, recommend cyber and physical security measures, and develop resilience and crisis management strategies. From analyzing historical incidents to exploring emerging threats, you will gain the knowledge and skills to safeguard urban infrastructure systems effectively. The course combines theoretical concepts with practical case studies and interactive discussions, equipping you with the tools needed to anticipate and address the complex challenges of modern urban security.
Quarter Credit Hours: 4 | Prerequisite: IN554

IN569: Global Cyber Defense
The expanding nature of cybercrime, cyber warfare, and malicious cyber-attacks that emerge from and are related to pandemics, wars, geopolitics, and expanded global crimes is driving the need for a cooperative global cyber defense approach. While countries have national cybersecurity regulations and laws, there is a need for a collaborative discussion about international norms that guide responsible cyberspace behavior at a global level. The Cybersecurity & Infrastructure Agency (CISA), the Joint Cyber Defense Collaborative (JCDC), the Center for Strategies and International Studies (CSIS), and NATO are organizations currently working toward this goal. This course will examine the existing global threats and global defense strategies in the following categories: national strategies, military strategies, digital content, personal data privacy, critical infrastructure, digital commerce, and cybercrime. The course will also explore how global cyberspace norms can be promoted and implemented, and you will learn about the organizations active in making this happen. The course will prepare you to become global cybersecurity leaders and prepare you to support and enable improved global cyber defense.
Quarter Credit Hours: 4 | Prerequisite: None

IN596: Master's-Level Data Analytics Internship I
The internship provides you with an opportunity to learn about careers in the field of data analytics through practical, real-world experiences and mentoring from data analytics professionals. This experience will improve your professional skills and your understanding of the expertise needed for career success.
Quarter Credit Hours: 2 | Prerequisite: Second to last term and good academic standing, or the permission of the Dean of the School of Business and Information Technology

IN597: Master's-Level Data Analytics Internship II
The internship provides you with an opportunity to learn about careers in the field of data analytics through practical, real-world experiences and mentoring from data analytics professionals. This experience will improve your professional skills and your understanding of the expertise needed for career success.
Quarter Credit Hours: 2 | Prerequisite: IN596

IN598: Applied Experiential Learning
The applied learning experience provides you with an opportunity to learn about various technology-related careers through practical, real-world experiences and mentoring from an industry professional. This experience will improve your technology skills and your understanding of the expertise needed for career success. This course is designed to bridge the gap between classroom learning and professional work environments, enabling you to apply your knowledge and develop essential skills through hands-on, industry-based projects.
Quarter Credit Hours: 4 | Prerequisite: Completion of at least 20 credits in the program or permission from the Dean of the School of Business and Information Technology

IN599: Master's Capstone in Data Analytics
This course synthesizes knowledge gained throughout all courses in your degree plan, and its comprehensive applied project demonstrates your mastery of this knowledge, as well as your relevant skills and abilities. The project will address an analytics case study in either the research community or industry and will indicate what you now offer to the industry upon completion of this program.
Quarter Credit Hours: 4 | Prerequisite: Last term or permission from the Dean

IT504: Managing Information Technology in a Business Environment
Business strategies, organizational structures, and information technology must be aligned to achieve organizational goals. In this course, you will identify innovative solutions to business problems. Specific topics include the analysis of cost and benefits found in emerging technologies, the legal and regulatory implications of various information technology infrastructure strategies, and the complexity enterprises face in integrating new technology with existing infrastructure (humans, machines, and processes).
Quarter Credit Hours: 4 | Prerequisite: None

IT504M1: Business Strategies in Information Technology
Assess business strategies as aligned to technology needs through appropriate communication techniques.
Quarter Credit Hours: 1 | Prerequisite: None

IT504M2: Laws, Rules, Regulations, and Ethical Principles in Information Technology
Defend laws, rules, regulations, and ethical principles relating to technology and the workplace.
Quarter Credit Hours: 1 | Prerequisite: None

IT504M3: Technical Documentation
Prepare documentation for hardware, software, and other client-related technology decisions.
Quarter Credit Hours: 1 | Prerequisite: None

IT504M4: Organizational Functions in Information Technology
Determine hiring, funding, and other functions within an organization.
Quarter Credit Hours: 1 | Prerequisite: None

IT510: Systems Analysis and Design
This course provides a detailed overview of system analysis and design methodologies. You will examine techniques to develop systems more efficiently, such as the system development life cycle (SDLC) and other processes. System requirements, functional design, display, and end-of-project conclusions and analysis are studied and practiced through a variety of activities.
Quarter Credit Hours: 4 | Prerequisite: None

IT510M1: System Planning, Analysis, and Logic Processes
Assess commonly used systems planning, analysis, and logic processes.
Quarter Credit Hours: 1 | Prerequisite: None

IT510M2: Data Organization Process
Draft data organization using a variety of industry-standard methods.
Quarter Credit Hours: 1 | Prerequisite: None

IT510M3: System Physical Attributes
Evaluate physical attributes of networks and web presence for a system.
Quarter Credit Hours: 1 | Prerequisite: None

IT510M4: Written Proposals for System Analysis and Design
Defend systems analysis and decision-making through a formal written proposal.
Quarter Credit Hours: 1 | Prerequisite: None

IT511: Information Systems Project Management
This course prepares you to be successful with project planning and execution. The topics are aligned with the approaches most commonly used in organizations, which include predictive (traditional), agile, and hybrid project management. You will learn key project planning and execution concepts and apply those concepts to an IT project of your own design.
Quarter Credit Hours: 4 | Prerequisite: None

IT511M1: Project Management Approaches for Information Technology
Investigate project management approaches.
Quarter Credit Hours: 1 | Prerequisite: None

IT511M2: Project Planning Principles
Explain principles for planning projects.
Quarter Credit Hours: 1 | Prerequisite: None

IT511M3: Project Execution Principles
Explain principles for executing projects.
Quarter Credit Hours: 1 | Prerequisite: None

IT511M4: Information Systems Project Plan
Develop an information systems project plan.
Quarter Credit Hours: 1 | Prerequisite: None

IT513: Research and Writing for the IT Professional
This course helps you develop the ability to research, synthesize, evaluate, discuss, and write about a variety of information technology concepts. Accurate grammar, suitable organization of ideas, and a formal writing style appropriate for IT professionals are emphasized, as well as the application of American Psychological Association (APA) style guidelines for writing, formatting, and citation/referencing. You will receive a comprehensive introduction to graduate-level writing and research while investigating technology topics of interest to you.
Quarter Credit Hours: 4 | Prerequisite: None

IT513M1: Using Professional Language
Illustrate information technology ideas with professional language and attribution.
Quarter Credit Hours: 1 | Prerequisite: None

IT513M2: Preparing Research
Prepare high-level research into information technology concepts with critical assessment and proper attribution.
Quarter Credit Hours: 1 | Prerequisite: None

IT513M3: Developing Research
Develop academic research, idea organization, writing, and formatting standards for a professionally written outcome on an information technology topic.
Quarter Credit Hours: 1 | Prerequisite: None

IT513M4: Synthesizing Solutions
Synthesize solutions to clients' technology problems using research, appropriate writing styles, and a suitable business format.
Quarter Credit Hours: 1 | Prerequisite: None

IT521: Decision Support Systems
This course provides a detailed overview of decision-making systems, models, and support in business. The course covers many fundamental topics including: analysis and development of decision support systems, business intelligence, knowledge acquisition and representation, knowledge management, intelligent systems over the Internet, and advanced intelligent systems.
Quarter Credit Hours: 4 | Prerequisite: None

IT521M1: Decision Support Systems Methodologies
Compare decision support systems methodologies.
Quarter Credit Hours: 1 | Prerequisite: None

IT521M2: Business Intelligence Systems
Analyze business intelligence systems.
Quarter Credit Hours: 1 | Prerequisite: None

IT521M3: Artificial Intelligence Systems
Examine artificial intelligence systems.
Quarter Credit Hours: 1 | Prerequisite: None

IT521M4: Knowledge Management Concepts
Assess the role of knowledge management in decision support.
Quarter Credit Hours: 1 | Prerequisite: None

IT522: Knowledge-Based Management Systems
This course provides a detailed overview of knowledge-based systems techniques and applications. Topics include symbolic structures and semantics, knowledge representation models, search techniques related to problem solving, knowledge engineering, knowledge and domain classification models, configuration models, and diagnosis and troubleshooting methodologies.
Quarter Credit Hours: 4 | Prerequisite: IT521

IT522M1: Knowledge Concepts
Examine the meaning, creation, and use of knowledge.
Quarter Credit Hours: 1 | Prerequisite: IT521

IT522M2: Knowledge Management Systems Impacts
Evaluate how organizations are impacted by knowledge management systems.
Quarter Credit Hours: 1 | Prerequisite: IT521

IT522M3: Knowledge Management in Organizations
Explain how knowledge is generated, transferred, represented, and exchanged in an organization.
Quarter Credit Hours: 1 | Prerequisite: IT521

IT522M4: The Case for Knowledge Management
Recommend a knowledge management system business case.
Quarter Credit Hours: 1 | Prerequisite: IT521

IT523: Data Warehousing Design and Development
This course discusses data warehousing. Topics covered in this course include: data warehousing architectures; data warehouse design; data warehouse dimensional modeling; data preparation and pre-processing; extraction, translation, and load (ETL) processing; business intelligence; executive information systems; dashboards; scorecards; drill up/drill down; slice and dice; managing unstructured data warehouses; terminologies, taxonomies, and ontologies and advanced data warehousing concepts. Advanced data warehousing concepts will include data warehouse appliances, big data, and big data technologies.
Quarter Credit Hours: 4 | Prerequisite: None

IT523M1: Data Warehouse Design Concepts
Review data warehouse architectures and modeling techniques.
Quarter Credit Hours: 1 | Prerequisite: None

IT523M2: Data Warehouse Development Techniques
Develop data warehouse development techniques by developing a dimensional data model.
Quarter Credit Hours: 1 | Prerequisite: None

IT523M3: Working With Unstructured Data
Examine data warehousing techniques, tools, and environments for working with unstructured data.
Quarter Credit Hours: 1 | Prerequisite: None

IT523M4: Advanced Data Warehouse Topics
Examine advanced data warehouse topics.
Quarter Credit Hours: 1 | Prerequisite: None

IT525: Database Design and Data Modeling
This course discusses the main tasks in designing a database and will use entity-relationship diagram (ERD) tools in this process. The course covers fundamental design topics including: data modeling, entity-relationship diagrams, enhanced entity-relationship diagrams, the top-down database design methodology, the bottom-up database design methodology, functional dependencies, and the normalization process. The course will also introduce you to advanced topics of database management.
Quarter Credit Hours: 4 | Prerequisite: None

IT525M1: Data Modeling Concepts
Use data modeling concepts.
Quarter Credit Hours: 1 | Prerequisite: None

IT525M2: Designing Databases Using Entity-Relationship Diagrams
Use entity-relationship diagrams in the design of a database.
Quarter Credit Hours: 1 | Prerequisite: None

IT525M3: Three Normal Forms
Construct relations in first, second, and third normal form.
Quarter Credit Hours: 1 | Prerequisite: None

IT525M4: Advanced Concepts in Database Design
Analyze advanced database concepts.
Quarter Credit Hours: 1 | Prerequisite: None

IT526: SQL Query Design
This course covers the Structured Query Language (SQL) programming language and its use to retrieve and modify data in a relational database. Methods of ensuring data isolation and consistency are explored. Designing queries for optimum performance is emphasized. Query execution plans will be used as a tool for creating appropriate indexes to improve query performance.
Quarter Credit Hours: 4 | Prerequisite: IT525

IT526M1: Using a Relational Database Management System
Use a Relational Database Management System (RDBMS) for effective database installation and manipulation.
Quarter Credit Hours: 1 | Prerequisite: IT525

IT526M2: SQL Single Table Query Commands
Apply SQL single table query commands effectively.
Quarter Credit Hours: 1 | Prerequisite: IT525

IT526M3: Composing Structured Query Language Queries
Compose Structured Query Language (SQL) queries for database information analysis.
Quarter Credit Hours: 1 | Prerequisite: IT525

IT526M4: Designing Structured Query Language Syntax
Design Structured Query Language (SQL) syntax to summarize and group data.
Quarter Credit Hours: 1 | Prerequisite: IT525

IT527: Foundations in Data Analytics
This course is intended to equip you with foundational skills in data analytics. These skills include problem/question definition, data identification and preparation, statistical and/or logical modeling, and evaluation and deployment. The course covers both categorization and prediction modeling, along with selecting the most appropriate methods for a given question and data set. The course uses industry standard software to enable you to learn analytical approaches, such as descriptive and inferential statistics, clustering and correlation, significance testing, power analysis, and other useful analytic techniques.
Quarter Credit Hours: 4 | Prerequisite: None

IT527M1: Documenting Business Problems
Outline a business problem to document the sources and types of data needed to address the issue.
Quarter Credit Hours: 1 | Prerequisite: None

IT527M2: Dataset Quality and Formatting
Describe the quality and formatting of datasets used in investigating business problems.
Quarter Credit Hours: 1 | Prerequisite: None

IT527M3: Preparing Datasets for Analysis
Prepare a dataset for analysis by formatting, augmenting or reducing, and transforming variables and observations.
Quarter Credit Hours: 1 | Prerequisite: None

IT527M4: Constructing Data Analytics Models
Construct useable and effective data analytics models incorporating industry-recognized software and standard algorithms.
Quarter Credit Hours: 1 | Prerequisite: None

IT528: Quantitative Risk Analysis
This course teaches you methodologies for using data analytics to detect, identify, and mitigate risk in a variety of forms. A variety of different quantitative risk assessment techniques are presented, including Failure Mode and Effects Analysis, fault tree analysis, expected payoffs, decision trees, and more. The case method is utilized to show real-world applications in finance, engineering, project management, loss/theft, loans, and fraud. The course will focus on formal risk processes. Issues of risk analysis ethics will also be included.
Quarter Credit Hours: 4 | Prerequisite: IT527

IT528M1: Common Risks and Their Ramifications
Enumerate common types of risks and their potential ramifications for modern business.
Quarter Credit Hours: 1 | Prerequisite: IT527

IT528M2: Assessing Risks
Apply quantitative and qualitative methods to assess, prioritize, and report risks.
Quarter Credit Hours: 1 | Prerequisite: IT527

IT528M3: Addressing Risks
Develop appropriate action plans that address risks.
Quarter Credit Hours: 1 | Prerequisite: IT527

IT528M4: Addressing Ethical Pitfalls
Recommend proactive measures to address ethical pitfalls to risk analytics activities.
Quarter Credit Hours: 1 | Prerequisite: IT527

IT530: Computer Networks
This course introduces data communications and networking technologies from the business perspective by heavily utilizing case studies and the decision-making process. Topics consist of network operating systems, local and wide area networks, and voice and wireless networks, as well as security and the internet. The focus will be on practical applications of these concepts, including support issues, administration, and management.
Quarter Credit Hours: 4 | Prerequisite: None

IT530M1: Business Impact of Virtualization
Examine the business impact of virtualization.
Quarter Credit Hours: 1 | Prerequisite: None

IT530M2: Centralized Server Architecture
Explore a centralized server architecture (client-server model).
Quarter Credit Hours: 1 | Prerequisite: None

IT530M3: Security Groups and Access
Analyze scenarios involving security groups and access to network resources.
Quarter Credit Hours: 1 | Prerequisite: None

IT530M4: Protocols and Topologies
Explore management aspects of protocols and topologies.
Quarter Credit Hours: 1 | Prerequisite: None

IT535: Advanced Network Management
Today's challenges in networking are focused on the design of cost-effective networks and keeping pace with emerging technologies. Topics include analysis and design models, Quality of Service (QoS), high-speed protocols, Voice over IP, and optical networks. This course will include the applied management perspective of advanced networking protocols as it pertains to administration and maintenance of networks.
Quarter Credit Hours: 4 | Prerequisite: None

IT535M1: Routing Protocols
Analyze switching, LAN, and internet routing protocols.
Quarter Credit Hours: 1 | Prerequisite: None

IT535M2: Technology Integration Planning
Construct a plan to integrate technology into a computer network.
Quarter Credit Hours: 1 | Prerequisite: None

IT535M3: Network Analysis and Design Modeling
Create an analysis and design model for a computer network.
Quarter Credit Hours: 1 | Prerequisite: None

IT535M4: Network Security Problems
Assess the impact of network security problems.
Quarter Credit Hours: 1 | Prerequisite: None

IT537: Introduction to Cybersecurity
This course provides an overview of cybersecurity concepts including data confidentiality, integrity, and availability, and an understanding of systems and applications software necessary for foundational understanding of cybersecurity. You will examine methods for network situational awareness and dynamic decision-making for predicting and assessing the impact of various cyberattacks. Aspects of cyber-strong organizational structures and mitigation are emphasized. The course will also cover various risk assessment methodologies necessary for understanding cyber risk, organizational preparedness and gap areas, and identifying improvement processes for an organization's decision makers.
Quarter Credit Hours: 4 | Prerequisite: None

IT537M1: Cybersecurity Processes
Assess appropriate cybersecurity processes that adhere to best practices and security governance.
Quarter Credit Hours: 1 | Prerequisite: None

IT537M2: Cybersecurity Threats and Risk Assessment
Synthesize cybersecurity threats and their potential consequences to assess risk.
Quarter Credit Hours: 1 | Prerequisite: None

IT537M3: Cybersecurity Scenario Strategies
Analyze technical scenario elements to determine cybersecurity strategies.
Quarter Credit Hours: 1 | Prerequisite: None

IT537M4: Effective Cybersecurity Solutions
Relate cybersecurity risk or vulnerabilities to effective security solutions.
Quarter Credit Hours: 1 | Prerequisite: None

IT540: Management of Information Security
IT professionals must focus on a wide range of security-related issues and develop security systems that address constantly changing threats. This course takes the approach that security components and business functions work in tandem. Topics like asset identification, human factors, compliance with regulations, personnel security, risk assessment, and ethical considerations are covered, as well as computer and network security tools and methods.
Quarter Credit Hours: 4 | Prerequisite: None

IT540M1: Security Policies
Implement a computer network security policy.
Quarter Credit Hours: 1 | Prerequisite: None

IT540M2: Securing Data
Secure computer network data.
Quarter Credit Hours: 1 | Prerequisite: None

IT540M3: Disaster Recovery Planning
Develop a computer network disaster recovery plan.
Quarter Credit Hours: 1 | Prerequisite: None

IT540M4: Regulatory Compliance
Assess computer networks for regulatory compliance.
Quarter Credit Hours: 1 | Prerequisite: None

IT542: Ethical Hacking and Network Defense
An ethical hacker is a security expert who attacks a system on behalf of the system's owners. This course focuses on discovering network vulnerabilities that a malicious hacker can exploit. The course explores penetration testing, footprinting and social engineering, scanning and enumeration, operating system weaknesses, and the methods used to hack web servers and wireless networks. You will perform hands-on projects using state-of-art hacking tools and techniques.
Quarter Credit Hours: 4 | Prerequisite: None

IT542M1: Methods for Reconnaissance and Social Engineering
Analyze the methods used by ethical hackers to perform reconnaissance and social engineering.
Quarter Credit Hours: 1 | Prerequisite: None

IT542M2: Vulnerability Testing
Perform vulnerability tests using computer and network tools and utilities.
Quarter Credit Hours: 1 | Prerequisite: None

IT542M3: Best Practices to Address Threats
Develop best practices to address web server and wireless network threats.
Quarter Credit Hours: 1 | Prerequisite: None

IT542M4: Addressing Security Vulnerabilities
Recommend security solutions to address discovered vulnerabilities.
Quarter Credit Hours: 1 | Prerequisite: None

IT543: Cryptography Concepts and Techniques
Never before has the use of cryptography been so wide spread or so necessary. In this course, you will learn how to protect susceptible networks from attack by implementing encryption techniques. You will examine encryption algorithms, substitution and transposition, block ciphers versus stream ciphers, public key cryptography, hash functions, digital signatures, and authentication protocols. The course offers hands-on projects using modern cryptographic tools.
Quarter Credit Hours: 4 | Prerequisite: IT530 or IT537

IT543M1: Development and Principles of Cryptography
Examine the historical development and basic principles of cryptography.
Quarter Credit Hours: 1 | Prerequisite: IT530 or IT537

IT543M2: Cryptographic Methods
Evaluate various cryptographic methods.
Quarter Credit Hours: 1 | Prerequisite: IT530 or IT537

IT543M3: Cryptographic Methods for Secure Communications
Develop secure communications using cryptographic methods.
Quarter Credit Hours: 1 | Prerequisite: IT530 or IT537

IT543M4: Implementing Cryptographic Methods
Design an implementation of cryptographic methods for an organization.
Quarter Credit Hours: 1 | Prerequisite: IT530 or IT537

IT544: Platforms, Applications, and Data Security
In this course you will appraise platform/operating system software configuration strategies and techniques as related to cybersecurity. You will examine secure application development techniques and the role of application security throughout the software development life cycle (SDLC). This course will also include strategies and techniques for securing data at rest and in motion.
Quarter Credit Hours: 4 | Prerequisite: None

IT544M1: Systems and Software Vulnerabilities
Determine vulnerabilities in both systems and application software configurations.
Quarter Credit Hours: 1 | Prerequisite: None

IT544M2: Cybersecurity Software Development Life Cycle
Analyze the cybersecurity software development life cycle (SDLC).
Quarter Credit Hours: 1 | Prerequisite: None

IT544M3: Cybersecurity Mitigation Strategies
Assess appropriate cybersecurity mitigation strategies that are specific to software systems.
Quarter Credit Hours: 1 | Prerequisite: None

IT544M4: Solutions for Securing Software Systems
Relate cyber risk or vulnerabilities to effective solutions for securing software systems.
Quarter Credit Hours: 1 | Prerequisite: None

IT545: Wireless, Mobile, and Cloud Security
This course examines strategies for managing the administration of wireless, mobile, cloud, and disruptive technological environments, such as social networking and the Internet of Things, in the context of cybersecurity.
Quarter Credit Hours: 4 | Prerequisite: None

IT545M1: Wireless, Mobile, and Cloud Cybersecurity Processes
Assess appropriate cybersecurity processes for wireless, mobile, and cloud infrastructures, as well as disruptive technologies.
Quarter Credit Hours: 1 | Prerequisite: None

IT545M2: Wireless, Mobile, and Cloud Cybersecurity Threats
Synthesize knowledge of cybersecurity threats to assess risk in wireless, mobile, and cloud infrastructures, as well as disruptive technologies.
Quarter Credit Hours: 1 | Prerequisite: None

IT545M3: Wireless, Mobile, and Cloud Cybersecurity Strategies
Analyze scenarios related to wireless, mobile, and cloud infrastructures, as well as disruptive technologies, to determine cybersecurity strategies.
Quarter Credit Hours: 1 | Prerequisite: None

IT545M4: Wireless, Mobile, and Cloud Cybersecurity Solutions
Analyze cybersecurity risks or vulnerabilities within wireless, mobile, and cloud infrastructures, as well as disruptive technologies, to develop effective cybersecurity solutions.
Quarter Credit Hours: 1 | Prerequisite: None

IT550: Computer Forensics and Investigations
This course explores the expertise required to conduct digital forensic investigations. Topics include investigation methods, problem-solving techniques, current forensics analysis tools, digital evidence acquisition and control, and impact of ongoing technological changes on digital forensics. Student projects include scenario-based investigations in investigating cybersecurity breaches.
Quarter Credit Hours: 4 | Prerequisite: None

IT550M1: Forensic Methods for Investigating Breaches
Analyze forensic methods used to investigate cybersecurity breaches.
Quarter Credit Hours: 1 | Prerequisite: None

IT550M2: Scenario-Based Investigations
Perform scenario-based investigations for cybersecurity breaches.
Quarter Credit Hours: 1 | Prerequisite: None

IT550M3: Forensic Analysis Tools
Evaluate forensic analysis tools for acquiring and preserving digital evidence during the e-discovery process.
Quarter Credit Hours: 1 | Prerequisite: None

IT550M4: The Impact of Technological Changes
Analyze the impact of technological changes on digital forensics techniques.
Quarter Credit Hours: 1 | Prerequisite: None

IT590: Legal and Ethical Issues in IT
This course provides a detailed discussion of the legal and ethical issues associated with the information technology age. Topics covered in this course include: ethical theories related to information technology, protection of intellectual property, privacy, computer and network security, cybercrimes, and ethical behavior for working in the computer industry.
Quarter Credit Hours: 4 | Prerequisite: IT513 or GB512

IT590M1: Law and Ethics Issues
Analyze legal and ethical issues in the field of information technology.
Quarter Credit Hours: 1 | Prerequisite: IT513 or GB512

IT590M2: Laws and Ethical Computing
Discuss recent legislation related to ethical computing.
Quarter Credit Hours: 1 | Prerequisite: IT513 or GB512

IT590M3: The Relationship of Ethical Conduct to Culture
Compare ethical conduct related to information technology across different cultures.
Quarter Credit Hours: 1 | Prerequisite: IT513 or GB512

IT590M4: Case Studies on Ethical Issues
Evaluate ethical issues in information technology case studies.
Quarter Credit Hours: 1 | Prerequisite: IT513 or GB512

IT591: IT Security Auditing and Assessments
In this course you will appraise all standards and information technology (IT) security audit processes, evaluate security controls, and examine governance of compliance and control responsibilities. Most organizations are required to comply with IT security regulations and/or standards resulting from the establishment of the Sarbanes-Oxley Act, General Computing Controls, the Gramm-Leach-Bliley Act (GLBA), the Federal Information Security Management Act (FISMA), and the Payment Card Industry Data Security Standard (PCI DSS), and you will become familiar with these standards and regulations.
Quarter Credit Hours: 4 | Prerequisite: None

IT591M1: IT Security Governance
Develop an IT governance strategy for an organization.
Quarter Credit Hours: 1 | Prerequisite: None

IT591M2: Cybersecurity Industry Standards and Regulations
Assess cybersecurity industry standards, compliance, regulations, and laws.
Quarter Credit Hours: 1 | Prerequisite: None

IT591M3: IT Security Auditing Processes
Apply auditing processes within a technical scenario.
Quarter Credit Hours: 1 | Prerequisite: None

IT591M4: IT Security Compliance Strategies
Analyze technical scenario elements for industry standards, compliance regulations, and laws to determine strategy.
Quarter Credit Hours: 1 | Prerequisite: None

IT592: Financial Decision-Making in IT and Security
This course introduces you to budgetary and financial decision-making tools applicable to an organization's information technology and security strategy. Effective use of these decision-making tools will enable future information technology and security leaders to justify resources needed for information technology and security solutions.
Quarter Credit Hours: 4 | Prerequisite: IT540

IT592M1: Financial Tools for Technical Environments
Analyze effective financial tools for technical environments.
Quarter Credit Hours: 1 | Prerequisite: IT540

IT592M2: IT Financial and Business Risks
Synthesize financial and business risks to develop long- and short-term strategic plans.
Quarter Credit Hours: 1 | Prerequisite: IT540

IT592M3: IT Finance Technical Strategies
Create technical strategies to allow an organization to meet its financial objectives.
Quarter Credit Hours: 1 | Prerequisite: IT540

IT592M4: IT Finance Strategic Alignment
Evaluate the components of technical plans or frameworks for strategic alignment with an organization's mission.
Quarter Credit Hours: 1 | Prerequisite: IT540

IT593: Master's-Level Cybersecurity Management Internship I
The internship provides you with an opportunity to learn about careers in the field of cybersecurity management through practical, real-world experiences and mentoring from cybersecurity professionals. This experience will improve your professional skills and your understanding of the expertise needed for career success.
Quarter Credit Hours: 2 | Prerequisite: Second to last term and good academic standing, or the permission of the Dean of the School of Business and Information Technology

IT594: Master's-Level Cybersecurity Management Internship II
The internship provides you with an opportunity to learn about careers in the field of cybersecurity managements through practical, real-world experiences and mentoring from cybersecurity professionals. This experience will improve your professional skills and your understanding of the expertise needed for career success.
Quarter Credit Hours: 2 | Prerequisite: IT593

IT595: Master's Capstone in Cybersecurity Management
The Master's Capstone in Cybersecurity Management synthesizes knowledge gained throughout all courses in the degree plan, and its comprehensive project demonstrates your mastery of this knowledge. The project will address a cybersecurity problem in either the research community or industry, and will indicate what you now offer to the industry, upon completion of this program.
Quarter Credit Hours: 4 | Prerequisite: Last term or permission from the Dean

IT596: IT Graduate Capstone Extension Course
This course should only be taken after IT 595: Master's Capstone in Cybersecurity Management or IT 599: Master's Capstone in Information Technology for the specific purpose of capstone project or thesis completion.
Quarter Credit Hours: 0 | Prerequisite: None

IT597: Master's-Level Information Technology Internship I
The internship provides you with an opportunity to learn about IT careers through practical, real-world experiences and mentoring from an IT professional. This experience will improve your technology skills and your understanding of the expertise needed for career success.
Quarter Credit Hours: 2 | Prerequisite: Second to last term and good academic standing, or the permission of the Dean of the School of Business and Information Technology

IT598: Master's-Level Information Technology Internship II
The internship provides you with an opportunity to learn about IT careers through practical, real-world experiences and mentoring from an IT professional. This experience will improve your technology skills and your understanding of the expertise needed for career success.
Quarter Credit Hours: 2 | Prerequisite: IT597

IT599: Master's Capstone in Information Technology
This course synthesizes knowledge gained throughout all courses in your degree plan, and its comprehensive applied project demonstrates your mastery of this knowledge, as well as your relevant skills and abilities. The project will address an information technology problem in either the research community or industry and will indicate what you now offer to the industry upon completion of this program.
Quarter Credit Hours: 4 | Prerequisite: Last term or permission from the Dean