COMPUTER INFORMATION SYSTEMS (CIS)

CIS 212-0 Introduction to Programming (1 Unit)
This course introduces core elements of object-oriented programming and teaches how to transfer those concepts into Java language. First, the basics of the Java language are given an overview: variable, conditionals, looping and user-defined methods. Classes/objects, data hiding/encapsulation, inheritance and aggregation as principles of object-oriented programming will be introduced through interactive lectures and labs. Note: Enrollment restricted to students who have completed CIS 110-CN. Instructor consent (permission number) is required for all other students.

CIS 313-DL Telecommunications and Computer Networks (1 Unit)
This course provides an overview of telecommunications and data communications. Course work includes local area network (LAN) and wide area network (WAN) components such as switches, routers, telecommunication circuits, and protocols. Advanced topics such as information security, information assurance, advanced networking technologies, and others will be overviewed as well.

CIS 413-0 Telecommunication and Computer Networks (1 Unit)
This course provides an overview of telecommunications and data communications. Course work includes local area network (LAN) and wide area network (WAN) components such as switches, routers, telecommunication circuits, and protocols. Advanced topics such as information security, information assurance, advanced networking technologies, and others will be overviewed as well.

CIS 413-DL Telecommunications and Computer Networks (1 Unit)
This course provides an overview of telecommunications and data communications. Course work includes local area network (LAN) and wide area network (WAN) components such as switches, routers, telecommunication circuits, and protocols. Advanced topics such as information security, information assurance, advanced networking technologies, and others will be overviewed as well.

CIS 414-0 Object-Oriented Programming (1 Unit)
This course focuses on developing complex programs using an object-oriented language. Students write programs that utilize functions and methods for code modularization and arrays for solving problems. Information hiding, encapsulation, inheritance, polymorphism, exception handling, and other principles of object-oriented programming will be introduced.

CIS 414-DL Object Oriented Programming (1 Unit)
This course focuses on developing complex programs using an object-oriented language. Students write programs that utilize functions and methods for code modularization and arrays for solving problems. Information hiding, encapsulation, inheritance, polymorphism, exception handling, and other principles of object-oriented programming will be introduced.

CIS 417-0 Database Systems Design & Implementation (1 Unit)
This course covers the fundamentals of database design and management. Topics include the principles and methodologies of database design, database application development, normalization, referential integrity, security, relational database models, and database languages. Principles are applied by performing written assignments and a project using an SQL database system.

CIS 417-DL Database Systems Design & Implementation (1 Unit)

This course covers the fundamentals of database design and management. Topics include the principles and methodologies of database design, database application development, normalization, referential integrity, security, relational database models, and database languages. Principles are applied by performing written assignments and a project using an SQL database system.

CIS 419-0 Web Application Development (1 Unit)
This course focuses on the design and development of object-oriented web applications. The client-server model and 3-tier architecture are discussed and analyzed. Topics covered include object-oriented methodology, enterprise software application architecture, design patterns, Enterprise JavaBeans, database connectivity, and web and application server development and technologies such as servlets, JSP, XML, HTML, security, JDBC, RMI, and multithreading. (Required: CIS 414-0 or CIS 414-DL and CIS 417-0 or CIS 417-DL.)

CIS 419-DL Web Application Development (1 Unit)
This course focuses on the design and development of object-oriented web applications. The client-server model and 3-tier architecture are discussed and analyzed. Topics covered include object-oriented methodology, enterprise software application architecture, design patterns, Enterprise JavaBeans, database connectivity, and web and application server development and technologies such as servlets, JSP, XML, HTML, security, JDBC, RMI, and multithreading. (Required: CIS 414-DL, MSDS 430-0 or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 431-0 Database Administration (1 Unit)
Provides students with advanced database administration and management concepts that are needed to perform the duties of a Database Administrator (DBA) in organizations that use relational database systems. Topics include: database organization and architecture, industry DBMS standards, system objects management, user roles and profiles, server installation and maintenance, backup/recover techniques, network configuration, and security management. (Required: CIS 417-0 or CIS 417-DL.)

CIS 431-DL Database Administration (1 Unit)
Provides students with advanced database administration and management concepts that are needed to perform the duties of a Database Administrator (DBA). Subjects will focus primarily on relational database systems, as well as introduction to PL/SQL and NoSQL. Topics include: server installation and maintenance, security principles, application design, high availability, disaster recovery, capacity planning, metadata management, backup/recovery techniques, PL/SQL, NoSQL. (Required: CIS 414-DL, MSDS 430-0 or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 435-0 Practical Data Science Using Machine Learning (1 Unit)
This course provides an overview of machine learning concepts, techniques, and tools, that will help students deepen their understanding of applying machine learning to real-world complex datasets to design intelligent systems. Students will learn machine learning techniques that can optimize business processes, identify new revenue models, drive digital transformation, and support evidence-based decision-making in industries such as finance, retail, and healthcare. (Required: CIS 414-DL, MSDS 430-0, or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 435-DL Practical Data Science Using Machine Learning (1 Unit)
This course provides an overview of machine learning concepts, techniques, and tools, that will help students deepen their understanding of applying machine learning to real-world complex datasets to design intelligent systems. Students will learn machine learning techniques that can optimize business processes, identify new revenue models, drive digital transformation, and support evidence-based decision-making in

industries such as finance, retail, and healthcare. (Required: CIS 414-DL, MSDS 430-0, or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 436-DL Data and Digital Platforms (1 Unit)
Data and Digital platforms are key investments that help companies gain competitive edge by enabling new digital business models and improving enterprise business performance. In this course students will gain hands-on experience in the implementation of Data and Digital platforms by leveraging public cloud and emerging technologies (e.g., big data technologies, AI/ML, APIs, digital twin, and IoT). This course will also prepare students to design and deliver enterprise scale digital transformation initiatives. (Required: CIS 414-DL, MSDS 430-0, or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL and CIS 435-0 or CIS 435-DL.)

CIS 452-0 Cybersecurity Attacks and Counter Measures (1 Unit)
This course helps students develop an understanding of computer network security and survivability principles. Course work includes the study of survivability, availability, threats, risk, and policy in a multi-user network. Additionally, students study technical solutions necessary to understanding and securing network information and communications; these include cryptography, firewalls, intrusion, anti-virus, anti-spam, wireless, VPN, host systems, network services, and network infrastructure. (Required: CIS 413-0 or CIS 413-DL.)

CIS 452-DL Cybersecurity Attacks and Counter Measures (1 Unit)
This course helps students develop an understanding of computer network security and survivability principles. Course work includes the study of survivability, availability, threats, risk, and policy in a multi-user network. Additionally, students study technical solutions necessary to understanding and securing network information and communications; these include cryptography, firewalls, intrusion, anti-virus, anti-spam, wireless, VPN, host systems, network services, and network infrastructure. (Required: CIS 413-0 or CIS 413-DL.)

CIS 453-0 Enterprise Security Strategy (1 Unit)
Enterprise Security Strategy helps students develop an understanding of the core components of a holistic information security program. Coursework includes the study of industry standard frameworks for risk management, organizational structures, budgeting, executive communication, and overall program development. In addition, students will examine effective policy strategies, privacy program development and understand how security programs are managed in real organizations. (Required: CIS 413-0 or CIS 413-DL).

CIS 453-DL Enterprise Security Strategy (1 Unit)
Enterprise Security Strategy helps students develop an understanding of the core components of a holistic information security program. Coursework includes the study of industry standard frameworks for risk management, organizational structures, budgeting, executive communication, and overall program development. In addition, students will examine effective policy strategies, privacy program development and understand how security programs are managed in real organizations. (Required: CIS 413-0 or CIS 413-DL.)

CIS 455-0 Disaster Recovery and Continuity (1 Unit)
Provides an in-depth study of the technical solutions necessary to support disaster recovery and business continuity in an enterprise networking environment. Course work includes the study of Risk and Business Impact Assessment (BIA), responding to a disaster, disaster recovery strategies, business continuity planning, and creating a recovery plan. Additional discussions will focus on designing a disaster recovery solution and surveying appropriate and current technologies and techniques, including RAID, SAN, clustering, backup solutions, LAN/WAN

designs, and environmental impact. (Required: CIS 413-0 or CIS 413-DL. Recommended: CIS 452-0 or CIS 452-DL.)

CIS 455-DL Disaster Recovery and Continuity (1 Unit)
Provides an in-depth study of the technical solutions necessary to support disaster recovery and business continuity in an enterprise networking environment. Course work includes the study of Risk and Business Impact Assessment (BIA), responding to a disaster, disaster recovery strategies, business continuity planning, and creating a recovery plan. Additional discussions will focus on designing a disaster recovery solution and surveying appropriate and current technologies and techniques, including RAID, SAN, clustering, backup solutions, LAN/WAN designs, and environmental impact. (Required: CIS 413-0 or CIS 413-DL. Recommended: CIS 452-0 or CIS 452-0.)

CIS 457-0 Management of Information Security (1 Unit)
This course emphasizes the need for information technology security and control and provides reasonable working knowledge required to manage information technology security and risk. This is accomplished through a comprehensive survey of security threats, risk analysis, control techniques, and managerial issues associated with establishing and maintaining an information technology security plan. (Required: CIS 413-0 or CIS 413-DL. Recommended: CIS 452-0 or CIS 452-DL and CIS 455-0 or CIS 455-DL.)

CIS 457-DL Management of Information Security (1 Unit)
This course emphasizes the need for information technology security and control and provides reasonable working knowledge required to manage information technology security and risk. This is accomplished through a comprehensive survey of security threats, risk analysis, control techniques, and managerial issues associated with establishing and maintaining an information technology security plan. (Required: CIS 413-0 or CIS 413-DL. Recommended: CIS 452-0 or CIS 452-DL and CIS 455-0 or CIS 455-DL.)

CIS 459-0 Innovation with Blockchain Technology (1 Unit)
This course will introduce students to blockchain and the benefits it has to offer. Through lectures, academic writing, lab sessions, and projects, this course is intended to help students understand blockchain to make business decisions and design/develop solutions using blockchain. (Required: CIS 414-0, CIS 414-DL, MSDS 430-0 or MSDS 430-DL.)

CIS 459-DL Innovation with Blockchain Technology (1 Unit)
More than a means to power cryptocurrency and exchange of digital collectibles, Blockchain technology represents transformative potential similar to the rise of the internet. Those who are well versed in programming these technologies will remain in high demand as it continues to find new applications across industries including Healthcare, Supply Chain, Mobility, Legal and Ecommerce. This course presents a hands-on introduction to the development of decentralized applications (DAPPS) for the Ethereum Blockchain. Students will concentrate on activities including the development, testing and deployment of smart contracts and corresponding user interfaces. In addition, this course will demonstrate competing Blockchain technologies as well as obtain insight into the future of what are known as decentralized autonomous organizations. Required: CIS 414-0, CIS 414-DL, or MSDS 430-DL)

CIS 460-0 Information Technology Management (1 Unit)
This course introduces students to the key challenges and responsibilities of managing information technology and an information technology organization. Students gain knowledge of the various facets of managing information technology including how to develop an IT strategy aligned with business strategy. Topics covered include the IT solution lifecycle, IT service management, IT supplier management and sourcing, ongoing IT technology operations, governance, business

continuity, budgeting, benchmarking, and industry standard management frameworks such as ITIL and COBIT. (Required: CIS 413-0 or CIS 413-DL. Recommended: CIS 452-0 or CIS 452-DL, CIS 455-0 or CIS 455-DL, and CIS 457-0 or CIS 457-DL.)

CIS 460-DL Information Technology Management (1 Unit)
This course introduces students to the key challenges and responsibilities of managing information technology and an information technology organization. Students gain knowledge of the various facets of managing information technology including how to develop an IT strategy aligned with business strategy. Topics covered include the IT solution lifecycle, IT service management, IT supplier management and sourcing, ongoing IT technology operations, governance, business continuity, budgeting, benchmarking, and industry standard management frameworks such as ITIL and COBIT. (Required: CIS 413-0 or CIS 413-DL. Recommended CIS 452-0 or CIS 452-DL, 455-0 or CIS 455-DL, and CIS 457-0 or CIS 457-DL.)

CIS 465-0 Information Technology Strategy (1 Unit)
This course introduces effective frameworks and methods for developing information technology and systems strategies that focus on meeting enterprises business objectives and on leveraging IT to competitively extend business capabilities. Topics covered include business driver identification and business and IT alignment; key technology components of the IT strategy, including enterprise architecture, enterprise systems, SOA and other integration technologies, networks, and data management; portfolio management; sourcing and hosting alternatives; emerging technologies and entrepreneurship. (Required: CIS 413-0 or CIS 413-DL. Recommended CIS 452-0 or CIS 452-DL, CIS 455-0 or CIS 455-DL, CIS 457-0 or CIS 457-DL, and CIS 460-0 or CIS 460-DL.)

CIS 465-DL Information Technology Strategy (1 Unit)
This course introduces effective frameworks and methods for developing information technology and systems strategies that focus on meeting enterprises business objectives and on leveraging IT to competitively extend business capabilities. Topics covered include business driver identification and business and IT alignment; key technology components of the IT strategy, including enterprise architecture, enterprise systems, SOA and other integration technologies, networks, and data management; portfolio management; sourcing and hosting alternatives; emerging technologies and entrepreneurship. (Required: CIS 413-0 or CIS 413-DL. Recommended CIS 452-0 or CIS 452-DL, 455-0 or CIS 455-DL, 457-0 or CIS 457-DL, and CIS 460-0 or CIS 460-DL.)

CIS 471-DL Digital Transformation: Strategy and Planning (1 Unit)
This course will cover core concepts surrounding digital transformation, including what it means to transform a business or public institution, what factors go into defining digital transformation, and what success looks like in digital transformation cases. Students will craft a framework for understanding how to build digital transformation strategies and how to identify and prioritize transformation opportunities. Students will also learn about the cultural, regulatory, and technological constraints impacting digital transformation. Students will then present the case for transformative change in a real-world target organization of their choice. (Required: CIS 414-0, CIS 414-DL, MSDS 430-0, or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 473-DL Digital Technologies (1 Unit)
This course is designed to equip students with the knowledge and skills needed to lead business transformation initiatives using digital technologies. The course will cover the basics of business transformation, including the key drivers and benefits, as well as the challenges and risks associated with it. The course will then dive into advanced technologies that are transforming different aspects of a business, including operations, customer experience, and new business models. These technologies will include Artificial Intelligence (AI), the Internet of Things (IoT), blockchain, and cloud computing. This course will include hands-on exercises and case studies to provide students with practical experience in implementing digital transformation initiatives using these technologies. This is a hands-on course where students will select business cases for digital transformation and, at the conclusion of the course, present a functioning prototype using digital technologies learned during the course. (Required: CIS 414-0, CIS 414-DL, MSDS 430-0, or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 475-DL Leading Digital Transformation Execution (1 Unit)
This course aims to equip students with the skills and knowledge needed to lead and drive digital transformation within organizations. The course will focus on digital capabilities, strategy, and execution and map them to enterprise functions. The students will also learn how to integrate people, processes, and technology elements in order to create digital capabilities that produce desired business outcomes. The course consists of hands-on learning where students will develop digital transformation strategies and identify required digital capabilities and processes in order to implement and monetize digital transformation initiatives. (Required: CIS 471-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 477-DL Enterprise Architecture (1 Unit)
This course explores the role of enterprise architecture in effective implementation of IT investments to achieve business goals. In this course, students will explore the basics of EA, such as reference architectures, architecture patterns, and will apply the methods and tools including TOGAF guides to design architectures for real-world initiatives. Additionally, students will learn how to architect enterprise level software solutions by collaborating with cross-functional teams including business, security, privacy, development, governance, infrastructure, operations, and IT program management. (Required: CIS 414-0, CIS 414-DL, MSDS 430-0, or MSDS 430-DL. Recommended: CIS 417-0 or CIS 417-DL.)

CIS 494-0 Project Management Concepts (1 Unit)
This course introduces effective frameworks and methods for developing information technology and systems strategies that focus on meeting enterprises business objectives and on leveraging IT to competitively extend business capabilities. Topics covered include business driver identification and business and IT alignment; key technology components of the IT strategy, including enterprise architecture, enterprise systems, SOA and other integration technologies, networks, and data management; portfolio management; sourcing and hosting alternatives; emerging technologies and entrepreneurship.

CIS 494-DL Project Management Concepts (1 Unit)
This course introduces effective frameworks and methods for developing information technology and systems strategies that focus on meeting enterprises business objectives and on leveraging IT to competitively extend business capabilities. Topics covered include business driver identification and business and IT alignment; key technology components of the IT strategy, including enterprise architecture, enterprise systems, SOA and other integration technologies, networks, and data management; portfolio management; sourcing and hosting alternatives; emerging technologies and entrepreneurship.

CIS 495-0 Enterprise Agility Frameworks (1 Unit)
The course will prepare students to apply Agile ways of working to projects, teams and organizations. Students will begin applying Agile project management techniques at the team or project level. By the end of the course students will be able to initiate, plan and execute an Agile project. A secondary focus of the course will be on those cultural and environment factors that impact the adoption of agile and ultimately successful agile transformation across an enterprise. Students will be

able to develop and defend a proposal for enterprise agile transformation. (Required: MSDS 475-DL)

CIS 495-DL Enterprise Agility Frameworks (1 Unit)
The course will prepare students to apply Agile ways of working to projects, teams and organizations. Students will begin applying Agile project management techniques at the team or project level. By the end of the course students will be able to initiate, plan and execute an Agile project. A secondary focus of the course will be on those cultural and environment factors that impact the adoption of agile and ultimately successful agile transformation across an enterprise. Students will be able to develop and defend a proposal for enterprise agile transformation. (Required: MSDS 475-DL.)

CIS 496-0 IT Finance & Communication (1 Unit)
This course is designed for those who want to sharpen their writing and communication skills for professional IT environments. Using a case study, students learn to apply measures of excellence in professional writing and communication in business environments, including audience analysis, persuasive writing, verbal and interpersonal communication, and document design and graphics. Writers gain experience writing individually and in collaborative environments, producing multiple drafts and receiving feedback from their peers and the instructor.

CIS 496-DL Business Writing and Communication (1 Unit)
This course addresses writing and communication applicable to a variety of career and professional occasions. Students will learn to analyze their audience and cultural context, determine an informative or persuasive purpose, and employ diverse writer's strategies. Additionally, students will learn how good communication practices can prevent or resolve professional challenges.

CIS 497-DL Information Technology Finance (1 Unit)
This course focuses on developing and managing an IT project budget as well as looks at the means of conveying information to ensure understanding and gain the cooperation of key partners in initiating positive IT financial initiatives.

CIS 498-0 Computer Information Systems Capstone Project (1 Unit)
This course provides experience in development and delivery of a large-scale software application that solves a real-world problem. This will be accomplished through a managed capstone software project that will cover all aspects of the software development life cycle including (but not limited to): discovery, requirements, design, implementation, testing, technical documentation, and deployment. Students will learn how to research a real-world problem, evaluate industry trends that address the problem, and consequently propose and implement their own solution to the problem. To accomplish this, students will learn how to apply the skills they acquired through the various tracks of the Computer Information System program to deliver the project, which in turn will set them up for success in their professional careers. (Required: CIS 413-0 or CIS 413-DL, CIS 414-0 or CIS 414-DL or MSDS 430-DL, and CIS 417-0 or CIS 417-DL. Must have completed 9 out of 11 units of credit.)

CIS 498-DL Computer Information Systems Capstone Project (1 Unit)
This course provides experience in development and delivery of a large-scale software application that solves a real-world problem. This will be accomplished through a managed capstone software project that will cover all aspects of the software development life cycle including (but not limited to): discovery, requirements, design, implementation, testing, technical documentation, and deployment. Students will learn how to research a real-world problem, evaluate industry trends that address the problem, and consequently propose and implement their own solution to the problem. To accomplish this, students will learn how to apply the skills they acquired through the various tracks of the Computer Information System program to deliver the project, which in turn will set

them up for success in their professional careers. (Required: CIS 413-0 or CIS 413-DL, CIS 414-0 or CIS 414-DL or MSDS 430-DL, and CIS 417-0 or CIS 417-DL. And must have completed 9 out of 11 units of credit.)

CIS 499-0 Independent Study (1 Unit)
Independent Study.

CIS 590-0 Capstone Research (1 Unit)
Capstone Research.

CIS 590-DL Capstone Research (1 Unit)
Capstone Research.