Digital Transformation (DGTR)

DGTR 1001. Emerging Technologies in Digital Transformation. (4 Hours)
Offers an overview of the key emerging sectors in digital transformation: cloud computing, blockchain, fintech, healthcare, IoT, IaaS, cybersecurity, drones, and immersive technologies (AR, VR, MR). Studies specific cases and examples to examine how each of these technologies contributes to the digital transformation of business.

DGTR 1101. Mathematical Structures and Methods. (4 Hours)
Introduces mathematical structures and methods that form the foundation of computer science. Examines structures such as sets, tuples, sequences, lists, trees, and graphs. Explores functions, relations, ordering, and equivalence relations, as well as inductive and recursive definitions of structures and functions. Covers principles of proof such as truth tables, inductive proof, basic logic, counting techniques, and arguments that are needed to estimate the size of sets, growth of functions, and space-time complexity of algorithms.

Attribute(s): NUpath Formal/Quant Reasoning

DGTR 1110. Business Foundations and Digital Transformation. (4 Hours)
Examines the structure and operation of businesses through the lens of digital transformation. Covers general business operations and practices and how these operations and practices have evolved within an increasingly digital-first workplace. Explores the internal elements of customer, strategy, and organization, as well as the external elements of competition, regulation, and market environment. Focuses specifically on digital transformation and the role of individual contributors to the organization. Offers students an opportunity to obtain context and understanding of economics, business operations, and other key business considerations from various global standpoints.

DGTR 1700. Data Management Systems. (4 Hours)
Explores how a wide range of enterprises around the world use information and information technology to create better-managed, more innovative, and successful organizations. Today's business leaders must have ready access to timely, accurate, and relevant information to manage effectively in the global economy. Offers students an opportunity to apply knowledge of data management systems using industry-standard cloud-based technology.

DGTR 1990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions.

DGTR 2150. Applied Data Visualization. (4 Hours)
Introduces the use of design, interaction, visualization techniques, and strategies to support the effective presentation and manipulation of business information, based on principles from art, design, psychology, and information science. Offers students an opportunity to learn how to choose appropriate methods for representing various kinds of business data to support analysis, decision making, and communication to organizational stakeholders. Students apply their knowledge of data visualization using industry-standard cloud-based technology, e.g., ServiceNow.

DGTR 2199. Database Design and Management 1. (4 Hours)
Covers the underlying principles and concepts of relational databases. Uses the reporting language SQL for creating and accessing data tables, indexing, arithmetic operations, loops, arrays, multiple table processing, I/P operations, data-type conversions, and views. Offers students an opportunity to use SQL to interrogate relational databases and design simple databases, applying their knowledge of relational databases using industry-standard cloud-based technology, e.g., ServiceNow.

Prerequisite(s): DGTR 1101 with a minimum grade of D-

DGTR 2299. Data-Driven Decision Making 1. (4 Hours)
Offers an in-depth focus on data-driven decision making in organizations. Uses solution-based case studies to examine the models, tools, techniques, and theory of data-driven decision making to improve the quality of business leadership decisions.

DGTR 2330. Organizational Culture and Change. (4 Hours)
Focuses on what drives the behaviors and actions of people in an organization. Explores topics such as motivation, influence, leadership, group dynamics, conflict, and other variables that impact organizational culture and change. Reviews key organizational behavior topics related to culture and change, including underlying theories and principles. Offers students an opportunity to analyze current cases that highlight practical application of the principles or underscore common themes or actions that impact culture and change in an organization.

DGTR 2500. Digital Fluency in the AI-Enabled Enterprise. (4 Hours)
Examines digital fluency for organizational leaders, including the syntax knowledge, sociolinguistic sensibility, and strategic expertise that a person gains and demonstrates in their use of information resources. Offers students an opportunity to improve their own digital fluency in the context of enhancing critical thinking, design thinking, and systems thinking.

Attribute(s): NUpath Natural/Designed World

DGTR 2501. Information Technology Project Management. (4 Hours)
Covers tools and techniques used to manage information technology projects. Topics include project planning, scheduling, budgeting, and project management tools. Discusses all phases of IT projects, from proposal evaluation through postimplementation reviews. Students plan and develop a project that offers a practical application of the topics covered in class. Offers students an opportunity to apply their knowledge of IT project management using industry-standard cloud-based technology, e.g., ServiceNow.

DGTR 2700. Foundations of Software Engineering. (4 Hours)
Covers the foundations of software engineering, including software development life cycle models (e.g., waterfall, spiral, agile); requirements analysis; user-centered design; software design principles and patterns; testing (functional testing, structural testing, testing strategies); code refactoring and debugging; software architecture and design; and integration and deployment.

DGTR 2822. Networks and Platform Technologies. (4 Hours)
Introduces the fundamentals of computer networks. Covers network architectures, topologies, and protocols; layering concepts (ISO/OSI, TCP/IP reference models); communication paradigms (point-to-point vs. multicast/broadcast, connectionless vs. connection oriented); and networking APIs (sockets). Also covers the construction of distributed programs, with an emphasis on high-level protocols and distributed state sharing. Topics include design patterns, transactions, performance trade-offs, security implications, and reliability. Uses examples from real networks (TCP/IP, Ethernet, 802.11) and distributed systems (web, BitTorrent, DNS) to reinforce concepts. Offers students an opportunity to apply their knowledge of networks and platform technologies using industry-standard cloud-based technology training, e.g., ServiceNow.

DGTR 2850. Intensive Foundations of Computer Science and Programming 1. (4 Hours)
Introduces the fundamental ideas of computing and programming principles. Discusses a systematic approach to word problems, including analytic reading, synthesis, goal setting, planning, plan execution, and testing. Presents several models of computing, beginning with functional program design. Explores the Python programming language, its syntax, mathematical functionality, and suitability for data analysis applications.

Prerequisite(s): DGTR 1101 with a minimum grade of D-

DGTR 2900. Digital Transformation and Decision Making. (4 Hours)
Introduces the fundamentals of individual reasoning and decision making in the context of digital transformation. Covers factors that influence decision making, such as personality, emotions and emotional intelligence, perception, and attribution. Explores the impact of situational variables on human behavior and decision making. Offers students an opportunity to apply these concepts to the study of human logic, decision-making processes, and common decision-making biases. Addresses the role of these topics in enabling organizational resilience.

DGTR 2901. Risk and Resilience in Digital Transformation Contexts. (4 Hours)
Introduces systems thinking and the ability to appreciate and plan for dynamic, constantly changing situations and environments. Risk management is a core theme in digitally driven organizations as the impact of disaster scenarios can wreak havoc. Reviews assessment strategies for business operations, as well as mitigation strategies in case of disruption. Examines how resilience, a skill set that has individual, organizational, and societal impacts, is established and maintained both by individuals and by organizations.

DGTR 2990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions.

DGTR 3000. Innovation and Design in Customer Experience. (4 Hours)
Introduces innovative processes, including design thinking, for removing constraints and biases, extending intellectual curiosity, and enhancing customer and user experience. Explores product research as well as product development and prototyping.

Prerequisite(s): DGTR 1001 with a minimum grade of D-
Attribute(s): NUpath Creative Express/Innov

DGTR 3100. Intensive Foundations of Computer Science and Programming 2. (4 Hours)
Covers more advanced topics in computing and programming principles. Explores advanced Python programming and design principles. Engages students in an extensive programming task that should result in the creation of a test suite. Explores pair programming and public code review techniques, as found in the industry today. Offers students an opportunity to apply their knowledge of computer systems and programming using industry-standard cloud-based technology, e.g., ServiceNow.

Prerequisite(s): DGTR 1101 with a minimum grade of D- ; DGTR 2850 with a minimum grade of D-

DGTR 3199. Database Design and Management 2. (4 Hours)
Studies the design of a database for use in a relational database management system. Uses the entity-relationship model and normalization in problems. Discusses relational algebra and SQL. Covers advanced topics, including triggers, stored procedures, indexing, elementary query optimization, and fundamentals of concurrency and recovery. Offers students an opportunity to implement a database schema and short application programs on one or more commercial relational database management systems, applying their knowledge of databases using industry-standard cloud-based technology, e.g., ServiceNow.

Prerequisite(s): DGTR 2199 with a minimum grade of D-

DGTR 3299. Data-Driven Decision Making 2. (4 Hours)
Continues DGTR 2299. Explores key areas in data-driven decision making in leadership and organizations through the utilization of case studies and applied hands-on projects. Examines core issues around quality of data, data analytic approaches, techniques, and measuring and managing of data in a customer-centric organization. Studies this topic through the lens of various business metrics and applied tools in the market.

Prerequisite(s): DGTR 2299 with a minimum grade of D-

DGTR 3310. Predictive Analytics. (4 Hours)
Introduces the end-to-end data-driven statistical modeling and predictive modeling approach with applications and case studies. Includes all the data and modeling steps in a full modeling cycle; exploratory data analysis and data cleansing for outlier imputation and data normalization; commonly applied modeling techniques such as classification, linear regression, and logistic regression; and modeling steps such as model training, validation, and testing.

Prerequisite(s): DGTR 1101 with a minimum grade of D-

DGTR 3500. Cybersecurity in Digital Transformation. (4 Hours)
Studies cybersecurity threats facing organizational information systems and digital assets. Examines an organization's legal and ethical responsibilities regarding data protection and security. Explores cyberthreats and adversaries, access control mechanisms, encryption, and hashing. Also covers the SecOps function, the security operations center, incident management, and digital forensics. Examines approaches and frameworks for evaluating the cyber-risks facing organizations, as well as actions that can be taken and mechanisms that can be employed to strengthen the security of organizational data and computing systems.

Prerequisite(s): IS 1300 (may be taken concurrently) with a minimum grade of D- or PHIL 1300 (may be taken concurrently) with a minimum grade of D-

DGTR 3550. Data Analytics in Digital Transformation. (4 Hours)
Introduces the subject of data analytics. Examines how raw data is collected, stored, cleansed, and interrogated in order to contribute to the needs of organizations. Covers four main areas of data analytics: descriptive, diagnostic, predictive, and prescriptive. Applies industry-standard software and Python packages commonly used for data analytics, encompassing basic graphical, numerical, and statistical tools. Offers students an opportunity to apply their knowledge of data analytics using industry-standard cloud-based technology, e.g., ServiceNow.

Prerequisite(s): DGTR 1101 with a minimum grade of D-

DGTR 3990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions.

DGTR 4000. Implementing Data Science. (4 Hours)
Studies how to approach data analysis problems in a systematic manner and how to design data analysis pipelines, as well as how to implement them at scale in the context of real-world problems. Data science is at the intersection of statistics, machine learning, and software development. Data analysis problems are solved in a series of datacentric steps: data acquisition, data cleaning, data transformation, data modeling, and data visualization.

Prerequisite(s): DGTR 3310 with a minimum grade of D-

DGTR 4100. Information Technology Service Management. (4 Hours)
Examines the frameworks and strategic approaches for the life cycle management of IT products—including planning, design, development, and delivery—and for improving IT services from a higher-level enterprise perspective—including the management of disparate servers throughout the organization. Covers the strategic management of IT infrastructure, agile IT service, configuration, data and information security, and disaster recovery in the context of cloud computing. Explores the strategies to provide value to customers. Offers students an opportunity to apply their knowledge of IT service management using industry-standard cloud-based technology, e.g., ServiceNow.

Prerequisite(s): DGTR 1110 with a minimum grade of D-

DGTR 4320. Voice of the Customer. (4 Hours)
Introduces students to the marketing function and the imperative of listening to the voice of the customer, or VOC. Explores the needs of modern customers for business-to-business (B2B) as well as business-to-consumer (B2C) products and services and how they influence operations in successful companies. Topics include principles of marketing, market research, marketing communications, and customer loyalty.

Prerequisite(s): DGTR 1110 with a minimum grade of D-

DGTR 4450. Strategy Consulting. (4 Hours)
Introduces the models, skills, and emerging trends in the field of strategic management consulting. Explores the global spectrum of consulting and reviews multiple consulting models and practices to compare and contrast the strengths and differences. Examines the evolution of the practice that is increasingly data driven and digital, with new technologies and AI innovations that drive process and strategy. Also explores the roles of influence and value creation. Offers students a hands-on and immersive opportunity to step into the role of a consultant, taking on real-world organizational challenges to develop critical-thinking skills; using analytical and systems-thinking approaches and tools to solve business problems; and developing skills for building and exercising influence within an organization and externally with clients.

Prerequisite(s): DGTR 1110 with a minimum grade of D- ; ENGW 3302 with a minimum grade of D-

DGTR 4580. Advanced Information Technology Service Management. (4 Hours)
Explores the IT Infrastructure Library, a best-practice framework for IT service management, which describes how IT resources should be best organized and managed to optimize organization goals. ITIL is independent of technology or business. Covers the fundamentals of ITIL: service strategy, service design, service transition, service operation, and continual service improvement. Offers students an opportunity to apply knowledge of data management systems using industry-standard cloud-based technology (e.g., ServiceNow training), as well as the opportunity to gain certification in ITIL.

Prerequisite(s): DGTR 4100 with a minimum grade of D-

DGTR 4720. Leadership and Personal Branding. (4 Hours)
Introduces the behavioral and communication skills needed to define and establish one's place in the professional world and the fundamentals of leadership in a business environment. Emphasizes the foundational skills needed to be effective and influential leaders, whether with or without formal power. Offers students an opportunity to clarify their skill sets, values, and career aspirations, as well as to take action to build a successful personal brand for their professional advancement.

Prerequisite(s): DGTR 1001 with a minimum grade of D- ; DGTR 1110 with a minimum grade of D-

DGTR 4910. Experiential Capstone. (4 Hours)
Offers students an opportunity, guided by the capstone faculty member, to apply their conceptual awareness and skills through a 15-week experiential, work-integrated project. Focuses on aligning a work-based project demonstrating a high level of technical skills and knowledge and reflecting mastery of the concepts covered by the courses for that academic year. The capstone focus can include an area of digital transformation covered throughout the program and might include a technical or data-driven challenge and solution, a process improvement challenge, a management challenge or opportunity, etc. Emphasizes independent research, in-depth analysis in digital technology solutions, and applied work-integrated skill development. Requires strong communication of findings and logic of ideas in a professional format as well as application of project management principles to work. May be repeated two times.

Attribute(s): NUpath Capstone Experience, NUpath Writing Intensive

DGTR 4990. Elective. (1-4 Hours)
Offers elective credit for courses taken at other academic institutions.