

CIS-GEN COMPUTER&INFO SCIENCE (CIS)

CIS 1003 Information Systems in Organisations and Society (3-1-3)

Understanding the essential role of information systems in support to organizations and society. Exploring the main components of an information system through the study of real case-based scenarios. Understanding the information systems underlying business processes, data, applications, and information technology. Identifying the importance of emerging technologies and their use in information systems to benefit businesses and individuals.

CIS 1103 Hardware and Networking (2-2-3)

Introduces the fundamental computer systems hardware, architecture and various components. Provide a comprehensive understanding of modern computer systems, by covering variety of computer devices, and peripherals. Explore the various communication techniques based on the network layer model including application, transport, network and link layers. Develop an understanding of peer to peer networking, computer network security and computer network management.

CIS 1203 Web Technologies (2-2-3)

Introducing the basic concepts of the World Wide Web and its underlying technologies. Topics include web clients and web servers, web protocols, HTML, CSS, website categories, design challenges, and standards. Throughout the course, a series of progressive assignments helps students gain hands-on experience in planning, designing, creating, and testing webpages and websites with multimedia elements using HTML, CSS, and a web authoring tool.

CIS 1303 Database Systems (2-2-3)

Examining the concepts of databases and database modeling and development. Topics include basic concepts of databases, 3-stage modeling and design methodology, Relational Database (RDB) concepts, conceptual data modeling using ERD, from ERD to RDB, data normalization, and SQL. Using hands-on activities, students will learn about designing a database, transforming into a normalized-relational model, and using SQL to define and manipulate data.

CIS 1403 Fundamentals of Programming (2-2-3)

Exploring fundamental programming concepts using Java Language. Topics include algorithms, variables, control statements, and methods. Throughout the course a series of progressive assignments help students gain hands-on experience in designing and writing algorithms to solve a computational problem, implementing programs within an integrated development environment, and explaining how programs implement algorithms in terms of instruction processing, program execution, and running processes.

CIS 2003 Statistics and Probability (3-1-3)

Discussing the fundamental concepts of probability and statistics with an emphasis on their application in Information Technology. Developing skills in probabilistic and statistical intuition for application in the discipline. Exploring the elements of descriptive statistics, discrete probability, probability distributions, sampling and inferential statistics, and their application in the field of computing and associated domains.

Prerequisites: LSM 1003 or LSM 1113 or MTH 1113

CIS 2013 Ethics and Sustainability for Computing (3-1-3)

Creating an understanding of ethical behavior and moral issues related to data collection, storage, and usage, examine ethical philosophies and their practical application, and evaluating ethical codes of practice and their implications for society. Categorizing ethical stakeholders and their importance of Information Systems. Understanding sustainability and adaptive systems and investigating sustainable processes, actions, and performance to support individuals, organizations, and society.

Prerequisites: CIS 1103

CIS 2023 Applied Discrete Mathematics (3-1-3)

Exploring different discrete math with a special emphasis on computer science applications. Topics include, but are not limited to, discrete Math objects such as sets, relations, discrete functions, graphs, trees, logic, sequences, summations, mathematical induction, and logical proofs. Throughout the course, a series of progressive assignments help students gain hands-on experience reading and constructing valid proofs of the algorithms' properties.

Prerequisites: LSM 1003, ICT 2013, CIS 2413

CIS 2103 Principles of Information Assurance, Security and Privacy (2-2-3)

The course describes the key concepts related to security and assurance of information assets. It explores information risks, security frameworks and controls, and relevant legal, ethical, and professional issues. It also discusses security-related activities, such as inspection and protection of information assets, detection of and reaction to threats, and examining pre- and post-incident procedures. The students will be designing and implementing an information assurance plan to protect an organisation's information.

CIS 2203 Applied Discrete Mathematics (3-1-3)

Introduce the functional computational aspects of a variety of data structures including sets, relations, discrete functions, graphs and trees. Engage with formal systems, including propositional and predicate logic, sequences, summations, and mathematical induction. Develop the capacity to read and construct valid proofs of the properties of algorithms.

Prerequisites: LSM 1003, ICT 2013

CIS 2303 Systems Analysis and Design (2-2-3)

Describing current systems analysis and design approaches. Covering key software engineering knowledge areas, including system development methodologies, requirements gathering and analysis, and modeling. Producing solutions for real-world mid-sized problems through analyzing their requirements and preparing the transition to design within an agile methodology. Using the Unified Modeling Language (UML) notation throughout.

Prerequisites: CIS 1303

CIS 2313 Database Development (2-2-3)

Applying theoretical and applied principles of relational database design to conceptualize, design and build a database free of data anomalies using stored procedures, functions, and triggers while securing the database. Describing how to maintain consistency and concurrency among data in a multi-user database environment and compare different concurrency modes' tradeoffs.

Prerequisites: CIS 1303, CIS 2103

CIS 2403 Object Oriented Programming (2-2-3)

Building upon Programming Fundamentals, this course covers the basic and intermediate concepts of object-oriented programming. Topics include classes, encapsulation, overloading, overriding, exception handling, and built-in collection frameworks. Throughout the course a series of progressive assignments help students gain hands-on experience in implementing UML class diagrams (Generalization/Specialization, Association, Aggregation) using Java.

Prerequisites: CIS 1403 or CIS 2413

CIS 2413 Data Structures and Algorithms (2-2-3)

Introducing the common structures used to store data and the standard algorithms for manipulating them. Topics include lists, stacks, queues, hash tables, searching, sorting, recursive, and traversals algorithms. A series of progressive assignments help students gain hands-on experience in implementing data structures and algorithms and make use of existing libraries to solve a variety of computational problems. Along with implementation details, students will learn to analyze algorithms' time and space efficiency and how to select appropriate data structures and algorithms.

Prerequisites: CIS 1403

CIS 2423 Programming for Data Analytics (2-2-3)

Building a strong foundation in data science programming skills, including data science lifecycle, question formulation, data collection and cleaning, exploratory data analysis and visualization, statistical inference prediction, and decision-making. Demonstrating skills in data engineering, such as writing correct code, working with version control tools, testing, and debugging. Emphasizing tackling real-world data science problems as found in the industry.

Prerequisites: ICT 2013, CIS 2003

CIS 2806 Work Related Experience I (0-240-6)

This course is designed as a framework within which a range of work related learning activities can be accommodated to meet defined learning outcomes. It gives the flexibility, for example, for students to learn from work experience and to receive an understanding of business and technology and its real life operations (where possible in their chosen major topic) or to undertake an industry based project which meets the same outcomes.

Prerequisites: CIS 2303, WPR 0100

CIS 2903 Operating Systems (2-2-3)

The course introduces operating system concepts, architecture, platform and features. Topics include process synchronization, interprocess communications, processor scheduling, memory management, virtual memory, I/O, and file systems. Open Source operating system will be used to perform installations, managing storage, managing files, administering users and group, installing and configuring local services.

Prerequisites: CIS 1103

CIS 3003 Human Computer Interaction (3-1-3)

Exploring the core principles of human-computer interaction. Topics include user-centered design, human cognitive principles and models, and multi-modal aspects of HCI. Throughout the course, a series of progressive assignments help students gain hands-on experience in evaluating interfaces using usability testing, dialogue methods, reaction time and display rates, information presentation, and creating sketches (LoFi) and high-fidelity interactive prototypes (HiFi) for selected business scenarios.

Prerequisites: CIS 2303

CIS 3023 Inferential Statistics (2-2-3)

This course introduces statistical inference methods for numerical and categorical data. Students will gain knowledge and skills to infer the properties of a population by testing hypotheses and deriving estimates. Using practical techniques and statistical software, students will perform parametric and non-parametric statistical tests to interpret and report results for both categorical and numerical data.

Prerequisites: CIS 2003, ICT 2013

CIS 3113 Object Oriented Analysis & Design (2-2-3)

Using object-oriented approaches to design systems. Expanding the analysis model into detailed designs ready for implementation. Constructing design models that are reliable by applying various design techniques (design patterns and architectural styles). Discovering issues that arise during transition from analysis to design phases and ensuring models' consistency. Designing solutions for business problems and preparing the transition to implementation within an agile methodology. Using the Unified Modelling Language notation and a CASE tool to apply concepts and techniques to case studies.

Prerequisites: CIS 2303

CIS 3123 Big Data Technologies (2-2-3)

Provides analytical skills to study big data and to provide a solid foundation for developing solutions that need to manipulate big data. This will also include investigating the rationale, current trends and features of modern NoSQL approach. Students will be introduced to a range of tools and techniques to manipulate and manage big data and to manipulate abstracted data into meaningful information. The course will examine industry challenges and solution use cases of using a big data approach.

Prerequisites: CIS 2313, CIS 2423

CIS 3203 Enterprise Architecture (3-1-3)

Develop advanced skills and knowledge about the foundational concepts of enterprise architecture and how it serves to integrate strategic, business, and technology planning methods to support enterprise-wide information technology resource development in the context of business requirements. Evaluate principles and best practices of enterprise architecture, and develop a comprehensive approach to articulating the subject matter involving real-world case studies.

Prerequisites: CIS 2303

CIS 3213 Business Process Management (2-2-3)

Developing students' knowledge and skills to use a Business Process Modeling tool to initially implement and then to continuously evaluate techniques and tools that support the planning, design, analysis, operation, and monitoring of business processes. Also, students will be able to apply core models that guide the development of process-based systems: Business Process, Business Decision, Business Process Architecture, and Business Data Model.

Prerequisites: CIS 2303

CIS 3303 System Architecture and Integration (3-1-3)

Introduce the concept of architecture in the context of system integration and architecture reflecting ISO/IEC/IEEE 42010. The architecture helps justify how complex systems can be represented using architectural views and how this can facilitate system evolution over time. The system integration addresses the middleware platforms in addition to business process integration and service integration as well as the data and information integration.

Prerequisites: CIS 2303

CIS 3403 Artificial Intelligence (2-2-3)

Introducing Artificial Intelligence (AI) technology which is increasingly prevalent in our everyday lives. It has uses in a variety of industries, from gaming to finance, robotics, and medical diagnosis. Topics include the basics and applications of AI, machine learning, probabilistic reasoning, robotics, computer vision, natural language processing, and how AI impacts society. This course incorporates hands-on exercises and projects.

Prerequisites: CIS 2413, CIS 3023

CIS 3413 Data Mining for Business (2-2-3)

Preparing and preprocessing data related to real business problems to derive predictive, descriptive, prescriptive models. Finding useful patterns in datasets using descriptive analytics tools and presenting them in easy to interpret visualizations within dashboards for tactical decisions. Discovering and extracting hidden knowledge from datasets by applying suitable data mining algorithms for strategic decisions related to planning. Understanding and complying with data privacy and ethical principles. Using data driven methodologies to solve real business cases, including SEMMA and CRISP-DM

Prerequisites: CIS 2313, CIS 2423

CIS 3603 Project Management (2-2-3)

The course develops an understanding of the basics of project management concepts and methods. It examines the project management framework, including key terminology, project management context, and project management processes. The students will be demonstrating skills in managing budgets, schedules, and human/material resource allocation activities associated with project management quality, communications, risk, and procurement.

Prerequisites: CIS 2303

CIS 3613 Enterprise Resource Planning (2-2-3)

This course provides the foundation for many disciplines in modern business information systems. By studying both successful and unsuccessful implementation of ERP software, students will examine how and why an ERP system is implemented and integrated with existing business processes and will learn the impact of ERP on an organization and how change can be managed. They will further develop an understanding of the impact of utilizing an ERP system to manage information across the functional areas of a business: sales and marketing, accounting and finance, human resource management, and supply.

Prerequisites: CIS 3213

CIS 3806 Work Related Experience II (0-240-6)

Working with staff from the host organization and support from a HCT mentor, students have an opportunity to apply computing practices and skills acquired during their studies in a workplace setting. The course is driven by an evidence-based portfolio approach to assessments and encourages students to critically reflect on their knowledge, skills and capabilities within the context of a workplace-centered project. This course requires students to demonstrate professional behavior, including adherence to ethical, legal and security standards, as applicable in a professional work environment.

Prerequisites: CIS 2303, WPR 0100

CIS 4003 Green Computing (3-1-3)

Introduce the study and practice of environmentally sustainable computing or IT. Identify the impact of Information and Communication Technology (ICT) on the environment and discuss the need for green computing as a countermeasure. Examine a variety of standards and approaches used in developing green computing both at the national level and globally. Analyze different scenarios and propose ways to implement green computing to counter the environmental impact of ICT.

CIS 4203 Information Technology Strategy and Governance (3-1-3)

Provides an understanding of IS Strategy and Governance, decision rights, strategic frameworks and mechanisms, alignment of strategy, governance and performance with related change management issues and schemes. The course highlights the fact that IS strategy and governance refers to allocation of responsibilities for the control of IS that enable accountability, participation, predictability and transparency. The course emphasises the responsibility of the board of directors and executive management in an organisation, and their integral role in enterprise governance.

CIS 4403 Cloud Computing (2-2-3)

Discuss classic data centres and how they can be migrated to a cloud solution. Examine cloud infrastructure solutions and build virtualised servers, desktops, applications and services. Implement a private cloud using the specification of a particular organisation.

Prerequisites: CIS 1003

CIS 4603 Project Management (2-2-3)

The course develops an understanding of the basics of project management concepts and methods. It examines the project management framework, including key terminology, project management context, and project management processes. The students will be demonstrating skills in managing budgets, schedules, and human/material resource allocations activities associated with project management quality, communications, risk and procurement.

CIS 4613 System Administration & Maintenance (2-2-3)

Covering the deployment and maintenance of modern computer systems. Topics include applications installation, configuration, and maintenance, including client-server services, content management and deployment, server administration and management, and user/group management. Use appropriate and emerging technologies to improve the performance of computer systems and discover the cause of performance problems in a system.

Prerequisites: CIS 2903

CIS 4703 Blockchain Applications and Coding (2-2-3)

Discusses the principles, framework, architecture, security, various algorithm, and data structure of Blockchain system. The course will examine the Blockchain solution components, including wallets, ledgers, participants, consensus, security, and smart contracts. The practical part of the course covers creating accounts, smart contracts, start and stop mining, private key files, building a block-chain network and deployment plan. The course will discuss number of use cases from different industries including supply chain, banking, and insurance.

Prerequisites: CIS 2403

CIS 4863 Special Topics In Computer Information Science (4-0-3)

Presents a theoretical or practical topic proposed by the faculty beyond what is offered in existing courses. Can be repeated for credit.

CIS 4913 Capstone Project I (1-4-3)

Students form teams to explore new and innovative ideas and define their project. They apply their knowledge of the development life cycle, project management, development tools, and skills gained throughout the program to propose, plan, analyze, and design an innovative IT/IS solution in response to an identified organizational or community need. Students complete project milestones and outcomes under supervision of a faculty and an industry mentor. Students are evaluated on each project phase and their ability to communicate, work in a team, and apply project management tools.

Prerequisites: CIS 2303

Corequisites: CIS 4603

CIS 4923 Capstone Project II (1-4-3)

The Capstone project is carried forward from the previous semester with student teams moving to the development, testing, and implementation of their project designs. Students continue to complete project milestones under the supervision of faculty and an industry mentor. They are evaluated on their ability to develop solutions based on their design, test the proposed solutions, and implement them. Students are expected to demonstrate skills in knowledge integration, application/system development, entrepreneurship, communication, self-management, and collaborative team work.

Prerequisites: CIS 4603, CIS 4913

CIS 4933 Capstone Project I (1-3-3)

Students form teams to explore new and innovative ideas and define their project. They apply their knowledge of the development life cycle, project management, development tools, and skills gained throughout the program to propose, plan, analyze, and design an innovative IS solution in response to an identified organizational or community need. Students complete project milestones and outcomes under supervision of a faculty and an industry mentor. Students are evaluated on each project phase and their ability to communicate, work in a team, and apply project management tools.

Prerequisites: CIS 3603, CIS 3613, CIS 2806

CIS 4943 Capstone Project II (1-4-3)

The Capstone project is carried forward from the previous semester with student teams moving to the development, testing, and implementation of their project designs. Students continue to complete project milestones under the supervision of faculty and an industry mentor. They are evaluated on their ability to develop solutions based on their design, test the proposed solutions, and implement them. Students are expected to demonstrate skills in knowledge integration, application/system development, entrepreneurship, communication, self-management, and collaborative teamwork.

Prerequisites: CIS 4933