This course aims to introduce the principles and fundamental techniques of artificial intelligence, and in particular, machine learning. Students will learn the fundamentals and state-of-the-art techniques and acquire practical insights into the current development of this field.

COMP 4016 Clinical Decision Support and Information Systems (3,2,1)

Prerequisite: COMP 2015 Data Structures and Algorithms, COMP 2016 Database Management

In this course, students will learn the methodology and techniques of medical data information management, and the models and algorithms used in computer-based clinical decision making. They will also learn the architectural design, structure, functions and components of clinical decision support systems and health care information systems.

COMP 4017 Computer and Network Security (3,3,0)

Prerequisite: COMP 2015 Data Structures and Algorithms, COMP 3015 Data Communications and Networking

This course introduces fundamental concepts and techniques in computer and network security. Topics include basic encryption techniques, cryptographic algorithms, authentication and digital signature, public key infrastructure, security models, network security, as well as their applications (e.g. IP security, Web security, trusted operating systems). Popular cryptographic standards and libraries will be introduced. Other advanced topics in computer security will also be discussed (e.g. intrusion detection, access control, secure programming, computer virus).

COMP 4025 Interactive Computer Graphics (3,2,2)

Prerequisite: COMP 2015 Data Structures and Algorithms

Students will learn (i) the mathematical foundation and algorithms for creating computer graphics including transformation, rendering, and (ii) the algorithms for enabling Human-Object interaction in virtual environment. Students will also gain practical experience on these topics by using graphics application programming interface (API) and develop a graphics application prototype.

COMP 4026 Computer Vision and Pattern Recognition (3,2,1)

Prerequisite: COMP 2015 Data Structures and Algorithms, MATH 1005 Calculus and MATH 2005 Probability and Statistics for Computer Science

This course gives students a broad knowledge on, and techniques used in contemporary research on computer vision and pattern recognition.

COMP 4027 Data Mining and Knowledge Discovery (3,2,1)

Prerequisite: COMP 2015 Data Structures and Algorithms, COMP 2016 Database Management and MATH 2005 Probability and Statistics for Computer Science

This course is aimed at providing an overview of concepts and techniques in knowledge discovery and data mining. Relevant applications in specific domains such as medicine and heath care will be covered.

COMP 4035 Database System Implementation (3,3,0)

Prerequisite: COMP 2015 Data Structures and Algorithms and COMP 2016 Database Management

This course provides an in-depth knowledge of relational database management systems (RDBMSs). Topics include data storage, index structures, query evaluation and optimization, transaction management, concurrency control and crash recovery. In addition, advanced topics such as database security, access control, distributed databases and data warehouses will also be covered.

COMP 4036 Digital Media Computing and Communications (3,2,1)

Prerequisite: COMP 3015 Data Communications and Networking

Students will learn the properties of digital media, the principles of digital media compression, the principles of digital media communication, and the protocols and methods for transporting digital media through the Internet.

COMP 4037 E-Technology Architectures, Tools and Applications (3,2,1)

Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming and COMP 3015 Data Communication and Networking

This course will develop students' understanding of recent developments in e-technologies, including XML, Web services, service-oriented architecture, Web-enabled business processes, as well as related architectures, tools, and applications. It will also enable students to acquire the capability to design and develop software systems based on e-technologies and to apply them to some domain applications.

COMP 4045 Human-Computer Interaction (3,2,1)

Prerequisite: COMP 3047 Software Engineering

This course provides an introduction to and overview of the field of human-computer interaction (HCI).

COMP 4046 Information Systems Control and Auditing (3,3,0)

Prerequisite: COMP 3015 Data Communications and Networking

This course provides the theory, techniques and practical issues related to computer-based information systems control and auditing. Students will learn the concepts, approaches, and techniques to carry out information system auditing and security controls in organizations.

COMP 4047 Internet and World Wide Web (3,2,1)

Prerequisite: COMP 3015 Data Communications and Networking

Students will learn the principles of the Internet and the World Wide Web, study some real-world Internet systems and applications, and learn some current topics.

COMP 4055 Medical Image Processing and Applications (3,2,1)

Prerequisite: COMP 2015 Data Structures and Algorithms, MATH 1005 Calculus, MATH 2005 Probability and Statistics for Computer Science

The course focuses on two areas. First, students will learn some fundamental image processing techniques and the characteristics of different types of medical images. Students are then able to apply different classical image processing techniques to different types of medical images. In the second part, students will learn the structure and components of a medical imaging management system. Students will be able to apply the picture archiving and communication systems to the medical images.

COMP 4056 Nature-Inspired Computing (3,2,1)

Prerequisite: COMP 2015 Data Structures and Algorithms, MATH 1205 Discrete Mathematics

This interdisciplinary Computer Science course provides an introduction to some interesting concepts, principles, and applications of computing, which are inspired by processes and phenomena found in nature. It offers students opportunities to appreciate those concepts, develop new insights and methods, and turn them into practical problemsolving and modeling applications.

COMP 4057 Distributed and Cloud Computing (3,3,0)

Prerequisite: COMP 3015 Data Communications and Networking

This course introduces the techniques underlying the design and engineering of distributed systems and cloud computing systems.

Topics include distributed system models, computer clusters, virtualization, datacenters, design of cloud computing platforms, and service-oriented architectures. Students will also acquire hands-on experience in cloud programming.

COMP 4065 Performance Modelling and Analysis of Computer Systems (3,2,1)

Prerequisite: MATH 1005 Calculus, MATH 2005 Probability and Statistics for Computer Science

This course provides students with basic knowledge and skills of performance modelling and analysis of computer systems. Topics to be covered include queueing systems, queueing networks, and computer simulations. In addition, some case studies will be introduced to help students acquire practical insights of this field.

COMP 4066 Principles of Programming Language (3,2,1)

Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming

This course introduces the concepts that underline most of the programming languages students are likely to encounter, and illustrates those concepts with examples from various languages. Topics include syntax and semantic analysis, bindings, type systems, programming paradigms, control abstraction and flow, and runnable program buildup.

COMP 4067 Theory of Computation (3,2,1)

Prerequisite: MATH 1205 Discrete Mathematics

This course aims to introduce some fundamental concepts in theoretical computer science. The topics include non-deterministic and deterministic finite automata, regular languages, context-free languages, pushdown automata, Church's hypothesis, Turing machines, computability, and complexity theory.

COMP 4075 Social Computing and Web Intelligence (3,3,0)

Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming, MATH 2005 Probability and Statistics for Computer Science

This course introduces the fundamental concepts as well as practical applications of contemporary Artificial Intelligence (e.g. incorporating knowledge discovery and data mining, social network intelligence, and intelligent agents) and advanced information technology in the context of Web empowered social computing systems, environments, and activities. In addition, it discusses the techniques and issues central to the development of social computing and Web intelligence computing systems.

COMP 4076 Selected Topics in Digital Media and Mobile Technology (3,2,1)

Prerequisite: The prerequisite depends on the selected topics. The prerequisite and the selected topics will be announced before the semester starts.

Students will learn some state-of-the-art topics in digital media or mobile technology.

COMP 4077 Selected Topics in Enterprise Systems and Business Intelligence (3,3,0)

Prerequisite: The prerequisite depends on the specific topics covered. The prerequisite and the chosen topics will be announced before the semester starts.

Students will learn state-of-the-art topics in enterprise systems and business intelligence. Emphasis will be placed on the current issues, methodologies and/or practice. After completing this course, students will understand some current topics in and methodologies of enterprise systems and business intelligence.

COMP 4085 Selected Topics in Intelligent Informatics (3,3,0)

Prerequisite: The prerequisite depends on the specific topics covered. The prerequisite and the chosen topics will be announced before the semester starts.

This course deals with the selected topics in intelligent informatics. Students will learn some state-of-the-art topics in intelligent informatics, through which students are able to solve the problems in some selected domains, such as machine learning, planning, self-organization, evolutionary computing, data mining, Web intelligence, intelligent agents, brain informatics, and parallel and distributed information processing.

COMP 4086 Selected Topics in Theoretical Computer Science (3,3,0)

Prerequisite: COMP 3005 Design and Analysis of Algorithms

This course provides an in-depth study on a selected topic of theoretical computer science. The topic to be covered may vary from semester to semester, and is to be determined by the instructor. The topic could be a specific area of algorithmic problems (e.g. graph algorithms, combinatorial optimization, etc.), or a particular algorithm design paradigm (e.g. randomized algorithms, parallel algorithms, etc.).

COMP 4087 Selected Topics in Web Technology and Data Engineering (3,3,0)

Prerequisite: The prerequisite depends on the specific topics covered. The prerequisite and the chosen topics will be announced before the semester starts.

Students will learn state-of-the-art topics in web technology and data engineering. Emphasis will be placed on the current issues, methodologies and/or practice. After completing this course, students will understand some current topics in and methodologies of Internet and large scale systems.

COMP 4096 Business Intelligence and Decision Support (3,2,1)

Prerequisite: COMP 2016 Database Management

Students will learn the methodologies and concepts of business intelligence, including the characteristics, architectures, and development of data warehouses and data marts. After completing the course, the students will understand the features and applications of Online Analytic Processing (OLAP), and identify the different types of OLAP. Emphasis will be placed on the understanding of enabling technologies and their applications to improve business operations and decision making in business and healthcare contexts.

COMP 4097 Mobile Computing (3,2,2)

Prerequisite: COMP 2007 Object Oriented Programming, COMP 3015 Data Communications and Networking

This course introduces the basic concepts and principles in mobile computing. This includes the major techniques involved, and networks and systems issues for the design and implementation of mobile computing systems and applications. This course also provides an opportunity for students to understand the key components and technologies involved and to gain hands-on experiences in building mobile applications.

COMP 4105 Web Search Principles and Technology (3,2,1)

Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming

This course provides a comprehensive examination of different popular search systems for diverse types of data such as text, image, video and audio information. Students will be introduced to the powerful features in these systems, as well as the technology underpinning them. Students will learn how large information repositories are efficiently organized, managed and searched, and the principles of Web search engines and information retrieval.

COMP 4106 E-Business Technology (3,3,0)

Prerequisite: Year III standing in Computer Science

This course introduces the use of technology in many aspects of a business, with particular emphasis on concepts and practices for modeling, specifying and integrating within-enterprise and B2B business processes. Business processes related to customer relationship management, enterprise resource planning, supply chain management, etc. will be covered. Students gain a heightened awareness of emerging technologies and trends in e-business.