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.