

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

Prerequisite: COMP 2015 Data Structures and Algorithms  
Students will learn the essential mathematical foundation and algorithms for creating computer graphics, and the methods of implementing these algorithms. Students will also gain practical experience on these topics by using graphics application programming interface (API).

**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 health 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 Communications (3,2,1)**

Prerequisite: COMP 3026 Digital Media Computing  
Students will learn the principles of digital media communications, study some multimedia communication systems and some current topics.

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

Prerequisite: COMP2007 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: *For Computer Science Programme:* COMP 3006 Software Engineering  
*For Computing and Information Systems Programme:* COMP 3007 Systems Analysis & Design

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 Parallel and Distributed Systems (3,3,0)**

Prerequisite: COMP 3015 Data Communications and Networking

This course introduces the needs, key concepts, and techniques underlying the design and engineering of parallel and distributed computing systems. The discussion will be emphasized on communications, synchronization and concurrency control, process management, distributed file services, and case studies. Also included is an introduction to parallel and distributed programming and parallel algorithms.

**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 2007 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.