**COMP 2006 Computer Organization (3,3,0)**
This course introduces the organization of digital computers, the different components and their basic principles and operations.

**COMP 2015 Data Structures and Algorithms (3,3,2)**
Prerequisite: COMP 2006 Computer Organization or COMP 2026 Problem Solving Using Object Oriented Programming

This course develops students' knowledge in data structures and the associated algorithms. It introduces the concepts and techniques of structuring and operating on Abstract Data Types in problem solving. Common sorting, searching and graph algorithms will be discussed, and the complexity and comparisons among these various techniques will be studied.

**COMP 2016 Database Management (3,2,1)**
Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming

This course introduces how to represent data in a database for a given application and how to manage and use a relational database management system (RDBMS). Topics include: entity-relationship model, relational data model, relational algebra, structured query language SQL and relation database design. In addition, hands-on RDBMS experience is included.

**COMP 2017 Operating Systems (3,3,1)**
Prerequisite: COMP 2006 Computer Organization, COMP 2026 Problem Solving Using Object Oriented Programme

This course introduces the fundamentals of operating systems design and implementation. Topics include an overview of the components of an operating system, mutual exclusion and synchronization, deadlock and starvation, implementation of processes and threads, resources scheduling algorithms, memory management, and file systems.

**COMP 2026 Problem Solving Using Object (4,3,3) Oriented Programming**
Prerequisite: COMP 1005 Essence of Computing

This course introduces the object-oriented programming concepts, principles, and techniques, including classes, objects, inheritance, and polymorphism. All these concepts are illustrated via a contemporary object-oriented programming language.

**COMP 3005 Design and Analysis of Algorithms (3,3,0)**
Prerequisite: COMP 2015 Data Structures and Algorithms, MATH 1205 Discrete Mathematics

This course is to introduce the techniques of designing efficient algorithms including divide-and-conquer strategy, dynamic programming, greedy and approximate algorithms, and so forth, and the applications of these techniques to design non-trivial algorithms, e.g. advanced data structures, graph algorithms, sorting algorithms and computational geometry. The time and space complexity of algorithms will be analysed from a theoretical point of view. Also, the issue of problem complexity will be addressed.

**COMP 3015 Data Communications and (3,3,1) Networking**
Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming

Students will learn the principles of data communications, computer networks and network programming.

**COMP 3016 Internship (1,0,0)**
Prerequisite: Year III standing or the consent of the Department

Through internship work, students are expected to acquire the following kinds of experience: (1) application of academic and professional information technology/information system knowledge to real-world problems; (2) interaction with clients and/or technical workers; and (3) the stringent requirements in the work environment. This experience prepares students for employment as professional practitioners upon graduation.

Students are required to work for at least six weeks full time or equivalent.

**COMP 3027 Enterprise Information Systems (3,2,1)**
Prerequisite: Year III or above standing in Computer Science

The course provides an advanced introduction to enterprise information systems and equips students with practical skills in the use of one type enterprise information systems.

**COMP 3035 Health Information Technology (3,3,0)**
Prerequisite: Year III or above standing in Computer Science

This course is designed to better equip computer science students for building their career in healthcare sector. After completion of this course, students will learn the structures, operations and workflow in healthcare organizations. Students are able to describe the data involved and data standards in the healthcare industry. Moreover, students can explain how IT can support and improve the healthcare systems.

**COMP 3045 Advanced Algorithm Design, (3,2,2) Analysis and Implementation**
Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming, COMP 2015 Data Structures and Algorithms

This course aims to help students develop advanced algorithm design and analysis skills as well as efficient programming techniques for solving a variety of challenging problems. The course has three major components: (1) theory of computation: automata, language theory, and computational complexity; (2) advanced programming techniques: collections, generic programming, and Java threads; and (3) problem solving: a variety of algorithms for real challenging problems.

**COMP 3046 Advanced Programming for Software (3,1,3) Development**
Prerequisite: COMP 2026 Problem Solving Using Object Oriented Programming

This course aims to further development students' skills in programming for software development by introducing advanced topics in programming. In addition, students' performance will be evaluated by group-project-based software application development to allow students to gain hands-on experience in working in teams. This course adopts studio-based learning approach which offers high degree of interaction, collaboration and constant feedbacks to students.

**COMP 3047 Software Engineering (4,2,2)**
Prerequisite: COMP 2015 Data Structures and Algorithms

This course discusses principles and practical aspects of software development.

**COMP 4005 Information Systems Theory, (3,2,1) Methodology and Architecture**
Prerequisite: Year IV standing in Computer Science

To extend students' knowledge of information systems and development methodology through the study of advanced theories and methodologies, and to provide students an integrative perspective of information systems and development. Also, more advanced system design related concepts will be introduced.

**COMP 4006 Information Technology (3,2,1) Professional Practices**
Prerequisite: Year IV standing in Computer Science

This course examines important professional issues in contemporary practice to help students become an effective participant in a team of IT professionals.

**COMP 4015 Artificial Intelligence and (3,2,1) Machine Learning**
Prerequisite: COMP 2015 Data Structures and Algorithms, MATH 1205 Discrete Mathematics and MATH 2005 Probability and Statistics for Computer Science

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    (3,2,1)**
**Information Systems**
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    (3,2,1)**
**Recognition**
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    (3,2,1)**
**Discovery**
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    (3,2,1)**
**Communications**
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,    (3,2,1)**
**Tools and Applications**
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    (3,3,0)**
**Auditing**
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    (3,2,1)**
**Applications**
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.