makes modern multimedia systems possible, data compression algorithms and the international standards of these digital media will be discussed.

COMP 3070 Digital Media Communications (3,2,1)
Prerequisite: COMP 3060 Digital Media Computing
Students will learn the principles of digital media communications, study some multimedia communication systems, and learn some current topics.

COMP 3080 Computer Graphics (3,2,2)
Prerequisite: COMP 1210 Data Structures and Algorithms and MATH 1140 Computational Mathematics
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 3090 Introduction to Web Intelligence (3,3,0)
Prerequisite: COMP 1180 Structured Programming and COMP 2330 Data Communications and Networking
This course introduces the fundamental concepts as well as practical applications of contemporary artificial intelligence (e.g. incorporating knowledge discovery and data mining, intelligent agents, and social network intelligence) and advanced information technology (e.g. involving wireless networks, ubiquitous devices, social networks, and data/knowledge grids) in the context of Web-empowered systems, environments, and activities. In addition, it discusses the techniques and issues central to the development of Web Intelligence (WI) computing systems.

COMP 3110 Data Mining and Knowledge Discovery (3,2,1)
Prerequisite: COMP 1160 Database Management, COMP 1210 Data Structures and Algorithms, and STAT 1210 Probability and Statistics
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 3120 Intelligent Systems (3,3,0)
Prerequisite: COMP 1180 Structured Programming and Year III standing
This course is aimed at providing an overview of the state-of-the art computational models and techniques for developing intelligent information systems, software solutions, and human-computer interfaces. Some practical applications in such areas as Web Intelligence, Business Intelligence and Personalized Assistance will be introduced. Related implementation issues will be discussed.

COMP 3130 Information Retrieval and Search Engine (3,2,1)
Prerequisite: COMP 1160 Database Management, COMP 1210 Data Structures and Algorithms and STAT 1210 Probability and Statistics
This course introduces the basic principles of information retrieval and search engine. Advanced models and techniques in information processing and retrieval will be covered.

COMP 3140 Computer and Network Security (3,3,0)
Prerequisite: COMP 1180 Structured Programming, COMP 2330 Data Communications and Networking, and Year III standing
This course introduces the fundamental concepts and techniques in computer and network security. Topics include basic encryption techniques, cryptographic algorithms, authentication and digital signature, public key infrastructure, access control, security models, as well as their applications to, for example, IP security, Web security, and trusted operating systems. In addition, it discusses other system and programming related security issues, including non-malicious errors, computer virus, and intrusion detection.

COMP 3150 E-Technology Architectures, Tools and Applications (3,2,1)
Prerequisite: COMP 2330 Data Communications and Networking and Year III standing
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 3160 Computer Vision and Pattern Recognition (3,2,1)
Prerequisite: COMP 1210 Data Structures and Algorithms and MATH 1140 Computational Mathematics
This course gives students a broad knowledge on and techniques used in contemporary research on computer vision and pattern recognition.

COMP 3170 Artificial Intelligence and Machine Learning (3,2,1)
Prerequisite: COMP 1210 Data Structures and Algorithms, MATH 1130 Discrete Structures and STAT 1210 Probability and Statistics
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 3180 Theory of Computation (3,2,1)
Prerequisite: MATH 1130 Discrete Structures
This course aims to introduce the fundamental concepts in theoretical computer science. The topics include deterministic and non-deterministic finite automata, regular language, context-free language, Turing machines, Church's thesis, halting problem, computability, and complexity. Also, the formal relationships between machines, languages and grammars are addressed.

COMP 3190 Principle of Programming Language (3,2,1)
Prerequisite: COMP 1150 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 3210 Computer Architecture (3,2,1)
Prerequisite: COMP 1210 Data Structures and Algorithms and MATH 1130 Discrete Structures
This course provides students the ideas and concepts required to understand the architectures of modem microprocessors, including instruction set principles, pipelining, instruction-level parallelism, memory hierarchy design, I/O, and internetworking. It also provides students the analytical tools for assessing processor performance.

COMP 3220 Database System Implementation (3,3,0)
Prerequisite: COMP 1160 Database Management and COMP 1210 Data Structures and Algorithms
This course is to provide an in-depth knowledge of relational database management systems (DBMS). Topics include data storage, index structures, query evaluation, transaction processing, concurrency control, and crash recovery. In addition, advanced topics such as distributed databases and data warehouses will also be covered.

COMP 3230 Advanced Software Engineering (3,2,1)
Prerequisite: COMP 2220 Software Engineering, or COMP 2010 Structured Systems Analysis and Design and COMP 2020 Object Oriented Systems Analysis and Design