

**REGULATIONS FOR THE DEGREE OF  
MASTER OF SCIENCE IN ELECTRONIC COMMERCE AND INTERNET  
COMPUTING  
(MSc[ECom&IComp])**

*(Applicable to students admitted in the academic years 2014-2015 and 2015-2016.)*

*(see also General Regulations)*

The degree of Master of Science in Electronic Commerce and Internet Computing (MSc[ECom&IComp]) is a postgraduate degree awarded for the satisfactory completion of a curriculum in the Faculty of Engineering. The curriculum is offered in part-time and full-time modes.

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**EC1 Admission requirements**

To be eligible for admission to the curriculum leading to the degree of Master of Science in Electronic Commerce and Internet Computing, a candidate shall

- (a) comply with the General Regulations;
  - (b) hold (1) a Bachelor's degree of this University in a relevant field; or  
(2) any other relevant qualification of equivalent standard from this University or from another university or comparable institution accepted for this purpose; and
  - (c) satisfy the examiners in a qualifying examination if required.
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**EC2 Qualifying examination**

- (a) A qualifying examination may be set to test the candidate's academic ability or his/her ability to follow the curriculum prescribed. It shall consist of one or more written papers or their equivalent and may include a dissertation.
  - (b) A candidate who is required to satisfy the examiners in a qualifying examination shall not be permitted to register until he/she has satisfied the examiners in the examination.
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**EC3 Award of degree**

- (a) To be eligible for the award of the degree of Master of Science in Electronic Commerce and Internet Computing, a candidate shall
    - (1) comply with the General Regulations; and
    - (2) complete the curriculum and satisfy the examiners in accordance with the regulations set out below.
  - (b) A candidate who has completed eight modules but has not satisfied the examiners for the award of the degree of Master of Science in Electronic Commerce and Internet Computing may be awarded a Postgraduate Diploma in Science (Electronic Commerce and Internet Computing) [PDipSc(ECom&IComp)] subject to approval of the Faculty Board.
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**EC4 Length of curriculum**

For the part-time mode of study, the curriculum shall extend over not less than two and not more than three academic years of study. For the full-time mode of study, the curriculum shall extend over not less than one and not more than two academic years of study. In both cases, a minimum of 300 hours of prescribed work are required.

## **EC5          Completion of curriculum**

To complete the curriculum a candidate shall, within the prescribed maximum period of study stipulated in Regulation EC4 above:

- (a) follow courses of instruction and complete satisfactorily all prescribed practical / laboratory work; and
  - (b) satisfy the examiners in all forms of assessment as may be required in either
    - (1) twelve modules which may include a dissertation of four modules; or
    - (2) at least nine modules successfully completed at this University (which may include a dissertation of four modules) and not more than three modules successfully completed at this or another university before admission to the Master of Science in Electronic Commerce and Internet Computing and approved by the Faculty Board.
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## **EC6          Course selection**

- (a) Selection of study patterns shall be made in consultation with and be subject to the approval of the Programme Director concerned.
  - (b) A candidate shall select modules according to the guidelines stipulated in the syllabus for the degree of MSc[ECom&IComp].
  - (c) Subject to the approval of the Committee on Taught Postgraduate Curricula on the recommendation of the Programme Director, a candidate may in exceptional circumstances be permitted to select additional module(s).
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## **EC7          Dissertation**

- (a) A candidate who is permitted to select a dissertation is required to submit it by a date specified by the Board of Examiners.
  - (b) All candidates shall submit a statement that the dissertation represents his/her own work undertaken after the registration as a candidate for the degree.
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## **EC8          Assessment and discontinuation**

- (a) The written examination for each module shall be held after the completion of the prescribed course of study for that module, and not later than January, May or August immediately following the completion of the course of study for that module.
- (b) A candidate, who is unable to complete the requirements within the prescribed maximum period of study specified in Regulation EC4 because of illness or circumstances beyond his/her control, may apply for permission to extend his/her period of studies. Any such application shall be made within two weeks of the day of examination for the paper in question.
- (c) A candidate who has failed to satisfy the examiners in a module or modules may be permitted to present him/herself either for re-assessment / re-examination in the module or modules of failure or for examination in the same number of new modules when the examination is next held. To proceed to the following year of the curriculum, a candidate must satisfy the examiners in a minimum of two modules of study in each academic year. A candidate who passes in less than two modules of study in an academic year may be recommended for discontinuation of studies under the provisions of General Regulation G12.
- (d) A candidate who has failed to satisfy the examiners in his/her dissertation may be required to submit or resubmit a dissertation on the same subject within a period specified by the Board of Examiners.

- (e) A candidate who has failed to satisfy the examiners at a second attempt in his/her dissertation within the specified period shall be recommended for discontinuation of studies under the provisions of General Regulation G12.
  - (f) A candidate who has failed to fulfill the requirements within the prescribed maximum period of study specified in Regulation EC4, including any extension, shall be recommended for discontinuation of studies under the provisions of General Regulation G12.
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**EC9      Assessment results**

At the conclusion of the examination and after presentation of the dissertation, a pass list shall be published. A candidate who has shown exceptional merit or merit at the whole examination may be awarded distinction or credit, as appropriate, and this shall be recorded on the candidate's degree diploma.

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# **SYLLABUSES FOR THE DEGREE OF MASTER OF SCIENCE IN ELECTRONIC COMMERCE AND INTERNET COMPUTING (MSc[ECom&IComp])**

## **OBJECTIVES**

The Master of Science in Electronic Commerce and Internet Computing seeks to provide students with a comprehensive framework on the Internet infrastructure, e-commerce principles and a fundamental spectrum of Internet computing technology in order to enable them to enhance, transform and innovate both traditional and new businesses.

## **CURRICULUM STRUCTURE**

### **Mode of Study**

The MSc(ECom&IComp) curriculum is offered in both part-time and full-time mode. For the part-time mode of study, the curriculum shall normally span two academic years of study, and the maximum period of study is three years. For the full-time mode of study, the normal period is one academic year, and the maximum period is two years.

### **Study Patterns**

Students are required to successfully complete 12 modules to graduate. They can do that by studying

- (a) 12 modules
- OR
- (b) 8 modules + Dissertation (equivalent to 4 modules)

### **Curriculum**

The curriculum tries to provide an integration of technology with businesses, and consists of modules (courses) falling into two major and related areas: electronic commerce (ECOM) modules and Internet computing (ICOM) modules. Students are encouraged to take modules in both areas, provided they have the necessary pre-requisite knowledge for the particular module. Extensive counselling will be provided to assist students to choose their modules.

### **Module Selection**

- i. Students have to complete at least 4 modules from the following list of fundamental modules:

Module code	Title
ECOM6004	Legal aspects of IT and e-commerce
ECOM6008	Supply chain and e-logistics management
ECOM6013	E-commerce technologies
ECOM6029	E-business transformation
ICOM6012	Internet infrastructure technologies
ICOM6034	Website engineering
ICOM6043	Information architecture
ICOM6045	Fundamentals of e-commerce security

- ii. Students can select any modules in MSc(ECom&IComp) discipline, which are listed in the module descriptions section below. They can be any mixture of modules from ECOM and/or ICOM area(s).
- iii. Students may also in exceptional circumstances select at most 2 Taught Postgraduate level modules offered by other curricula in the Faculty of Engineering as electives.

## **MSc(ESCom&IComp) Module descriptions**

It is the goal of the programme to have a comprehensive and dynamic curriculum in order to meet the challenges and opportunities of the fast developing Internet world. Therefore the modules, both in terms of range and syllabus, are updated and revised continuously and are subject to the approval of the University's Senate. The list of modules below is not final and some modules may not be offered every year.

All modules are assessed through examination (0%-100%) and/or coursework assessment (0%-100%).

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### **SYLLABUS**

#### **ECOM6004 Legal aspects of I.T. and e-commerce**

This module provides an introduction to some of the main legal problems generated by recent developments in information technology and e-commerce, and their possible solutions. Topics to be covered include copyright, patent protection for software and business methods, domain name disputes and other intellectual property issues on the Internet, contractual issues of on-line trading, public key infrastructure and electronic transactions, privacy and data protection.

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#### **ECOM6008 Supply chain and e-logistics management**

The module is designed to prepare you to apply business strategies, analytical methodologies and information technology in supply chain management. Traditionally industries have focussed on operation evaluation and performance improvement of mainly the manufacturing process; however, the deficiency of supply chain coordination results in severe downgrade of business competitiveness. With advent of information technology, computers not only improve manufacturing operation and management and also strategic decision-making as well. This module focuses on the systems approach to the planning, analysis, design, development, and evaluation of supply chain and e-logistics management.

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#### **ECOM6009 Project (4 modules)**

(for students admitted in or before the academic year 2013-2014)

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#### **ECOM6013 E-commerce technologies**

This module provides an overview of those technologies currently used in electronic commerce and an introduction to some likely to play a major role in the future. Topics include (but are not limited to) networking systems, social networking and media, computer and network security, payment systems, data mining and "big data", the Internet of Things, mobile systems and digital media technologies.

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#### **ECOM6014 E-marketing**

This module considers how to create customer centric strategies for e-businesses. Marketing focuses on the interaction between the producer and the consumer. This focus remains unchanged in e-marketing, but our ability to foster this interaction with technology has been dramatically increased. The Internet provides new forms of communications like web sites, e-mail, social media, and mobile communications. However, these technologies do not necessarily replace traditional marketing

vehicles like mass media, direct mail, and telephone marketing, but instead augment them to improve the customer experience. The basic premise of this module is that these technologies can be used to fulfill the goal of a customer-centered marketing strategy.

The goal for this module is to develop a set of principles so that managers can effectively develop and implement e-marketing strategies. A core framework that we will use in this module is an interactive marketing strategy. Interactive marketing goes by many names, including customer relationship management (CRM). E-marketing allows companies to interact with consumers on an individual basis and create customized products and services using personalized knowledge about a consumer. As part of this module we develop a compatible set of quantitative techniques to implement interactive marketing strategies. Throughout the module we explore examples and cases to understand how e-marketing is evolving in practice.

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### **ECOM6016    Electronic payment systems**

The module covers banking systems, e-payment security, foreign exchange, Internet banking, wireless payments, stored-value cards, micropayments, peer-to-peer payments, electronic and virtual currencies such as Bitcoin, large-scale B2B payments and the future of money. Particular attention is given to Hong Kong and Mainland China banking and payment systems.

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### **ECOM6020    Customer relationship management: business strategies and techniques**

The objectives of this module are to understand CRM concepts; CRM business strategies; typical business applications for CRM; and the process to implement CRM projects.

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### **ECOM6022    Topics in electronic commerce**

This module covers advanced topics in areas in electronic commerce that are relevant at the time. Leaders in the field, expert practitioners and distinguished scholars in the field around the world will be invited to participate in this module.

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### **ECOM6023    E-financial services**

This module provides students with the fundamentals in the operations as well as the management of electronic commerce in the financial service industry. It presents an overall picture of e-commerce applications in the financial sector and also the future development trends in e-finance. Specific topics include managerial financial knowledge before e-finance, creative destruction & framework of e-finance; the recent development of e-banking, e-brokerage, e-warrant, e-insurance, e-wealth management, valuation of technology, value based management as well as current issues in e-finance. Various cases will be studied.

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### **ECOM6024    Mobile and pervasive commerce**

With over 4.5 billion mobile phone users worldwide, new wireless and pervasive computing applications and services are changing the way enterprises interact with their customers and employees. The explosion in smartphone ownership along with the deployment of 4G networks is leading to a slew of new mobile applications and services. They range from mobile commerce services to wireless enterprise apps and mobile social networking apps, all the way to more futuristic Internet of Things and intelligent assistant solutions.

### **ECOM6029 E-business transformation**

The Internet has shortened business transaction cycles, expanded market reach, and allowed companies to build and manage customer relationship more effectively. Today almost every company is trying to find out how best to deploy the Internet throughout its value chain to improve operational effectiveness, entrench strategic position, and ultimately create sustainable competitive advantage. Transformational initiatives, however, are difficult to implement and prone to failure as companies must grapple with a whole host of strategic, organizational, technical and increasingly global issues.

This module builds on the basic principles of business and economics to examine the role of the Internet as a strategic necessity. It provides a roadmap for transforming companies into inter-networked enterprises where proprietary and shared infrastructures are used to link customers, suppliers, partners and employees to create superior economic value. You will learn how the Internet can provide firms with the necessary infrastructure needed to align their business strategy with IT strategy, streamline front-end and back-end processes, manage relationships and partnerships, and adapt to emerging global issues such as outsourcing and offshoring.

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### **ECOM6030 Web 2.0 strategy and innovation**

This module covers the fundamental principles of Web 2.0 Strategy and Innovation, providing a systematic framework, business cases and hands-on experience with the online Internet, mobile and social media business models that have transformed society, business, nonprofit and government worldwide.

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### **ECOM6032 E-discovery and digital forensics**

This module will give the students an in-depth understanding of the current IT management and e-business litigation practices involving e-discovery and digital forensics, and will help them to take a leading role in the management team to work with the legal counsel, auditor and department managers to prepare and implement an effective Incident Response Strategy to address various IT-business and legal problems in today's global competition and innovation driven economy.

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### **ECOM6033 Geospatial information and technology for location-based services**

Location-based services (LBS) are the collection of data and technology that drive popular applications such as in-car navigation, mapping of nearby points of interest on cell phones, automatic notification of weather hazards as they impact travel along a highway route, location-based advertising, geosocial networking, and tracking of inventory in warehouses. These applications leverage the user's or object's physical location to locate and access additional relevant information. LBS is enabled by the nexus of the Internet, wireless and geospatial technology realms. While geospatial technology is perhaps the least understood of these, geospatial content and services comprise the majority of the value component in LBS. To help students explore the full value of LBS, this module examines how to identify, obtain and manage the location-based information that users need and the geospatial technology and content behind LBS called Geographic Information Systems (GIS).

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### **ECOM6036 Entrepreneurship development**

The scope of this module would be mostly on Venture Design: the stages from idea creation to the formation of a start-up company, with successful venture capital funding and management

team in place. The perspective should be that of a potential entrepreneur wanting to start up a company, or start up entrepreneurial activities within a large company. Special attention will be put into topics on people who make decisions, handle deals, analyze problems, allocate and mobilize scarce resources and succeed in a local and international context. Some Asian and China cases are carefully chosen to reflect the special situation of starting businesses in Asia/China.

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### **ECOM6037    Developing business models for digital media**

The module introduces digital media cases and platforms that are used as a foundation for student work to design business models for media concepts. The module specifically explores business models focused on social media and content apps for handheld devices. This means not only smart phones, but also notebooks and tablets such as the i-Pad as well as devices and controllers used for electronic games. Special attention will be paid to developments in Hong Kong and Mainland China.

Agile methods like effectuation and the business model development canvas are applied to identify, develop, and argue the case for launching an innovative digital media product. The aim of the module is therefore to ensure that students have the necessary competencies to select and further develop an appropriate business model for a digital media innovation of their choice should they want to join the media industry.

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### **ECOM7000    Dissertation (4 modules)**

(for students admitted in or after the academic year 2014-2015)

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### **ICOM6011    Project (4 modules)**

(for students admitted in or before the academic year 2013-2014)

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### **ICOM6012    Internet infrastructure technologies**

This module takes a systematic approach to study the various components which form the infrastructure of the Internet. It provides a comprehensive coverage of existing and emerging Internet technologies and applications. Topics include: access and backbone network technologies; IP addressing and routing architectures; standard transport and application protocols; operating principles and internals of network entities. We will focus not only on how the Internet works but also its design rationale and engineering tradeoffs.

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### **ICOM6027    E-crimes: digital crime scenes and legal sanctions**

This module helps participants to grapple with crimes in the electronic age from both technical and legal points of view. It addresses three important aspects of the subject, namely, technologies adopted in e-crimes, legal sanctions and management of e-crimes scenes. Topics covered include: trends in e-crimes; different types of e-crimes, tools and technologies for committing e-crimes; laws relating to e-crimes and criminal sanctions; digital forensics, post-incident and live-forensic crime scene management, chain of evidence, collecting and collating digital evidence.

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### **ICOM6029    Topics in Internet computing**

This module covers advanced topics in areas in Internet computing that are relevant at the time.



Leaders in the field, expert practitioners and distinguished scholars in the field around the world will be invited to participate in this module.

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### **ICOM6034 Website engineering**

This module will introduce the standards, the software technologies and some good practices for implementing websites and web applications. It aims at covering an "end-to-end" picture of content delivery and presentation on the web, that is, from the "server-sides" where data is stored, adapted or integrated, to the "client-sides" with various demands and capabilities. It will suit students who wish to have a technical understanding on the subject or a career in website engineering, as it will introduce the techniques for building maintainable, extensible, interactive and mission-critical websites and web applications, using state-of-the-art standards and open-source tools.

The topics covered will be organized into four parts: (1) Website development basics (enabling standards and technologies, responsive web design, basic web security); (2) Design and implementation of web applications (rich Internet applications, client-side frameworks, MVC design patterns and libraries, content management systems); (3) Interoperability of web applications and services (web API protocols, mashups, cloud services for web development); and (4) Optimizations (traffic analysis, search engine and performance optimization techniques).

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### **ICOM6037 The new telecommunications landscape: convergence to Internet protocol, seamless mobile communications, and new services**

The Telecommunications landscape is undergoing important changes.

The first factor contributing to this change is the convergence to Internet protocols. The adoption of a common protocol architecture on which to build infrastructure and services has the merit of decreasing equipment and management costs, and of providing ease of inter-working among networks. Most telecom standards organizations are developing IP-based standards, and many network operators plan on supporting only IP-based infrastructures.

The second factor is the development of communications solutions aimed at providing seamless communications to mobile users. Examples are wireless networking technologies such as WiFi, Wimax and mesh networks, as well as the IEEE 802.21.

The third important factor is the provisioning of new IP-based telecommunications services, such as Voice over IP, IPTV, inter-vehicular communications, and cloud Computing.

The goal of this module is to expose the students to advances in telecommunications, encompassing new technical solutions as well as new services.

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### **ICOM6039 E-business architecture**

Every proper e-business system has an architecture. The objectives of this module are to help students understand the components of e-business architecture and to design an architecture for efficient and effective e-business applications.

To do that, students will first need to learn how to identify the business needs/requirements, and how to design e-business applications using such leading edge methodologies as the Model Driven Architecture (MDA) from the Object Management Group (OMG); the Architecture Standard from IEEE (IEEE 1471); and Service oriented architecture (SOA) from various industry leaders.

Secondly, they must also learn about the enterprise architecture (EA) and the Component Business Modeling (CBM) to address business requirements and design business architectures. In addition, they will learn how to use architecture patterns such as e-business patterns in the technology architecture design.

To help students to understand the e-business architecture practice, we will also cover the selected architecture designs case studies for various e-business applications.

Given newly emerging technologies such as cloud computing and the Internet of Things (IoT) are becoming increasingly prevalent and important, we will lastly and briefly discuss how to make architecture design by using these technologies for e-business applications.

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### **ICOM6040 eHealth information technologies**

The module will cover core clinical modeling, terminology, and information concepts that drive the development of eHealth standards. It will also cover the future directions of eHealth in semantic-health data.

Prerequisites: Students must have completed ICOM6043 or can demonstrate to the instructor that they have equivalent knowledge.

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### **ICOM6041 An introduction to cloud computing**

This module offers an overview of current cloud technologies, and discusses some issues in the design and implementation of cloud systems, and the impact cloud computing on business.

Topics include some basic understanding of cluster hardware architecture (e.g., multicore, GPU, high-speed network), cluster middleware for realizing the concept of single system image (e.g., software distributed shared memory) and virtualization techniques (e.g., Xen, KVM, VMWare) used in current data centers. We will discuss three types of Cloud computing platforms, including SaaS, PaaS, and IaaS, by providing motivating examples from major cloud computing players such as Google, Amazon, and Microsoft. We will also introduce Map/Reduce programming paradigm for large-scale data analysis.

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### **ICOM6042 Designing apps for smart mobile phones**

Smart phones have dominated the technology market in recent years, led by the major brands of iPhones, Android, Symbian and Windows phones. These increasingly powerful phones are supported by a whole range of applications (abbreviated to “Apps”) developed and uploaded for commercial or free distribution by professional as well as aspiring programmers that a whole new worldwide market has sprung up. More and more of these apps have been specially designed and developed for corporations that they are now beginning to play an important role in e-business operations.

This module introduces the design principles of these apps, their development, testing, and marketing as well as the technology platforms and programming languages for use on small screens. Hands-on practice is provided for students to gain confidence and some expertise, so that they can be on their way to exploit this new emerging career opportunity.

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### **ICOM6043 Information architecture**

This module covers the technical and strategic approaches of Enterprise Information Architecture that cover the conceptual, logical and implementable views of information and data-driven applications and services to support effective enterprise and domain interoperability. This module will develop the critical skills to understand and apply information architecture techniques and frameworks from structured to semantic information modelling, data and metadata management, linked open data ontologies and knowledge management, information governance principles, and to develop information architecture technology strategies.

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### **ICOM6044 Data science for business**

The emerging discipline of data science combines statistical methods with computer science to solve problems in applied areas. In this case we focus on how data science can be used to solve business problems especially those in electronic commerce. By its very nature e-commerce is able to generate large amounts of data and data mining methods are quite helpful for managers in turning this data into knowledge which in turn can be used to make better decisions. These data sets and their accompanying quantitative methods have the potential to dramatically change decision making in many areas of business. For example, ideas like interactive marketing, customer relationship management, and database marketing are pushing companies to utilize the information they collect about their customers in order to make better marketing decisions.

This module focuses on how data science methods can be applied to solve managerial problems in marketing and electronic commerce. Our emphasis is developing a core set of principles that embody data science: empirical reasoning, exploratory and visual analysis, and predictive modeling. We use these core principles to understand many methods used in data mining and machine learning. Our strategy in this module is to survey several popular techniques and understand how they map into these core principles. These techniques are illustrated with case studies. However, the emphasis is not on the software for implementing these techniques but on understanding the inputs and outputs of these techniques and how they are used to solve business problems.

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### **ICOM6045 Fundamentals of e-commerce security**

This module provides an in-depth understanding of basic security problems and relevant e-commerce solutions, while helping students implement today's most advanced security technologies, such as designing secure Web, e-commerce, and mobile commerce applications, securing corporate internal network, and providing secure employee/user authentication.

Key topics include: Security mechanisms, key management and certificates, payment security services, communication network and network access layer security, Internet layer security and transport layer security, application layer security, hypertext transfer protocol, web server security, web client security, mobile code security, mobile agent security, mobile commerce security.

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### **ICOM7000 Dissertation (4 modules)** (for students admitted in or after the academic year 2014-2015)

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