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

(See also General Regulations)

Any publication based on work approved for a higher degree should contain a reference to the effect that the work was submitted to The University of Hong Kong for the award of the degree.

The degree of Master of Science (MSc) in Electronic Commerce and Internet Computing is a postgraduate degree awarded for the satisfactory completion of a course of study in the Faculty of Engineering. The major part of the curriculum must be formed from modules in either the Electronic Commerce stream or the Internet Computing stream. The programme is offered in part-time or full-time mode.

EC1 Admission requirements

To be eligible for admission to the courses 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 a recognized University in a relevant subject; or

(2) another 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.

EC2 Qualifying examination

(a) A qualifying examination may be set to test the candidate's formal academic ability or his ability to follow the courses of study prescribed. It shall consist of one or more written papers or their equivalent and may include a project report.

(b) A candidate who is required to satisfy the examiners in a qualifying examination shall not be permitted to register until he has satisfied the examiners in the examination.

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

(i) comply with the General Regulations; and

(ii) 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.

EC4 Length of curriculum

For the part-time mode of study, the curriculum shall normally extend over not less than two and not more than three academic years of study. For the full-time mode, 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

(a) To complete the curriculum a candidate shall, within the prescribed maximum period of study stipulated in Regulation EC4 above:
  (i) follow courses of instruction and complete satisfactorily all prescribed practical / laboratory work; and
  (ii) shall either satisfy the examiners in either
    (1) twelve modules at the prescribed written examinations; or
    (2) eight modules and a project report or dissertation on a subject within the approved field of study.

  The examiners may also prescribe an oral examination.

(b) A candidate who fails to fulfill the requirements within the specified (i) three years for the part-time mode of study or (ii) two years for the full-time mode shall be recommended for discontinuation under the provisions of General Regulation G12, except that a candidate, who is unable because of illness or circumstances beyond his control to complete the requirements within the prescribed maximum period of study, may apply for permission to extend his period of studies. Any such application shall be made within two weeks of the first day of the examination paper in question.

(c) [For 2006-07 intake and thereafter] At the time of application for admission, candidates may submit request for advanced standing on the basis of studies successfully completed within or outside this University. Advanced standing of up to three modules may be granted on the following conditions:
  (i) the programme is at postgraduate level offered by a recognized institution;
  (ii) a satisfactory result is obtained from the course concerned; and
  (iii) evidence such as transcript and syllabus is submitted to prove that the course concerned is equivalent in content to a module as prescribed in the regulations and syllabuses below.

EC6 Course selection

(a) Selection of study patterns shall be made in consultation with and be subject to the approval of the Programme Director.

(b) A candidate who is permitted to select the study pattern under section (a)(ii)(1) of Regulation EC5 shall select twelve modules which include a minimum of seven modules from the syllabuses of the candidate's approved stream of study.

(c) A candidate who is permitted to select the study pattern under section (a)(ii)(2) of Regulation EC5 shall select eight modules which include a minimum of five modules from the syllabuses of the candidate's approved stream of study.

(d) Subject to the approval of the MSc(ECom&IComp) Programme Director and the Head or Course Co-ordinator of the departments concerned, a student may in exceptional circumstances be permitted to select at most two modules from the syllabuses for the degree of MSc(Eng) and/or that for the degree of MSc(CompSc)

(e) Subject to the approval of the Faculty Higher Degrees Committee on the recommendation of the Programme Director, a candidate may in exceptional circumstances be permitted to select an additional module.

EC7 Project report or dissertation

(a) For part-time mode of study, a candidate shall submit the title of his project report or dissertation by a date specified by the Board of Examiners. A candidate may submit his completed project report or dissertation after the successful completion of four modules but shall not submit it later than the end of August of the third academic year of his studies unless special permission is granted for this period to be extended.

(b) For the full-time mode of study, a candidate shall submit the title of his project or dissertation by a date specified by the Board of Examiners. A candidate must submit the completed project report or dissertation not later than the end of August of the second academic year of his studies unless special permission is granted for this period to be extended.

(c) All candidates enrolled in any mode of study shall submit a statement that the project report or dissertation represents his own work (or in the case of conjoint work, a statement countersigned by his co-worker, which shows his share of the work) undertaken after the registration as a candidate for the degree.

EC8 Examinations

(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 has failed to satisfy the examiners in a module or modules may be permitted to present himself either for 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.

(c) A candidate who has presented an unsatisfactory project report or dissertation may be required to submit a revised project report or dissertation on the same subject within a specified period.

(d) A candidate who has presented an unsatisfactory project report or dissertation for a second time shall be recommended for discontinuation of studies under the provisions of General Regulation G12.

(e) A candidate who has failed to submit a satisfactory project report or dissertation within the prescribed maximum period of study, including any extension, shall be recommended for discontinuation of studies under the provisions of General Regulation G12.

EC9 Examination results

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

MASTER OF SCIENCE IN ELECTRONIC COMMERCE AND INTERNET COMPUTING (Electronic Commerce Stream)

PROGRAMME STRUCTURE

The *ECom* stream aims at offering participants with a business background a good understanding of the revolution and the convergence of new technologies on global business, and, as current or future managers, a good grasp of the impact and the exciting opportunities for electronic commerce.

Modules for the Electronic Commerce (*ECom*) stream

Candidates must either select (a) 8 modules and a project; or (b) 12 modules. All selection will be subject to approval by the Programme Director.

(a) If candidates opt for the enrolment mode of 8 modules and a project, at least 5 modules must be from the *ECom* list below, the remaining 3 may be from the *IComp* list.

(b) If candidates opt for the enrolment mode of 12 modules without the project, at least 7 modules must be from the *ECom* list below, the remaining 5 may be from the *IComp* list.

Candidates may also in exceptional circumstances select at most 2 modules from the syllabuses for the degree of MSc(Eng) and that for the degree of MSc(CompSc), subject to approval of the Head of the Department or Course Co-ordinator concerned in accordance with the provisions of Regulation EC6(d).

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 therefore subject to change.

ECom Modules Available:

Core Modules (select at least 4 modules):

E-business transformation
E-commerce technologies
Internet and the WWW
Legal aspects of I.T. and e-commerce
Supply chain and e-logistics management

Electives:
Customer relationship management: business strategies and techniques
E-business and systems: analysis and strategic management
Electronic payment systems
E-financial services
E-marketing
Geo-spatial information for e-business applications
Internet and e-commerce security
Mobile and pervasive commerce
Technology convergence and digital entertainment
Topics in electronic commerce

SYLLABUSES

ECOM6001. Internet and the WWW (core)

This module provides an introduction to the components and technologies that enable eCommerce. It focusses primarily on the Internet and the World Wide Web, but also considers the devices that are used by consumers, corporate buyers and sellers, and service-providers. Internet topics include the layers of protocols particularly TCP, IP and key applications, including the DNS, email and P2P. World Wide Web topics include Web architecture, HTML and other ML's, and processing capabilities on both the client and server sides.

ECOM6004. Legal aspects of I.T. and e-commerce (core)

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.

ECOM6008. Supply chain and e-logistics management (core)

The objectives of this module are to provide participants with: (a) an understanding of the impact of supply chain management and related issues on the success and profitability of the modern organization; (b) the major challenges faced in implementing an integrated supply chain management strategy, as well as approaches for meeting these challenges; (c) the information technology, business models, and analytical problem-solving skills to develop solutions for a variety of logistics and supply chain problems; (d) the case study about the application and the development of logistics and supply chain technology in Hong Kong industries.

ECOM6009. Project (4 modules)

ECOM6013. E-commerce technologies (core)

This module provides an overview of the technologies used in electronic commerce. These include (but not limited to) networking, object-oriented technology, computer and network security, smartcard and RFID, data mining and digital media technologies.

ECOM6014. E-marketing (elective)

This module considers how to create customer centric strategies for e-businesses. Marketing focuses on the interaction between the producer and the consumer. Although this focus remains unchanged in e-marketing, our ability to foster this interaction with technology has been dramatically increased. The Internet provides new forms of communications like web sites, e-mail, 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 primary focus of this module is how to more effectively implement marketing strategies using electronic technology. During this module we develop the notion of an interactive marketing strategy. This 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.

ECOM6016. Electronic payment systems (elective)

This module deals with technology and computer systems for managing and handling payments across electronic networks. It covers topics on payment gateways, clearance, credit card transactions, digital cash, micro-payments, authenticity, integrity, intermediaries and risk management.

ECOM6020. Customer relationship management: business strategies and techniques (elective)

The objectives of this module are to understand CRM concepts and business strategies; CRM technologies and systems, typical business applications for CRM; and the process to implement CRM projects. CRM development in the People's Republic of China will be covered.

ECOM6022. Topics in electronic commerce (elective)

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.

ECOM6023. E-financial services (elective)

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.

ECOM6024. Mobile and pervasive commerce (elective)

With around 2.5 billion mobile phone users worldwide, including several hundred million mobile Internet users, new wireless and pervasive computing applications and services are changing the way enterprises interact with both their customers and their employees. The explosion in smart phone ownership along with the growing popularity of WLAN technologies and the deployment of 3G and 3.5G networks is leading to a slew of new Internet applications and services. They range from mobile commerce services to wireless enterprise applications all the way to more futuristic pervasive computing scenarios. This growing trend is not just about technologies and new business models. It is also about new usage scenarios that overcome the limitations of mobile devices to support users in the context of a broad range of time critical activities and about addressing privacy challenges entailed by these scenarios.

ECOM6025. Technology convergence and digital entertainment (elective)

This module is a critical study of the established and fledgling digital entertainment industry that has emerged in the wake of digitalisation and technological convergence. The emergence and continual development of the digital entertainment industry (including console and online games, rich media services on mobile devices, virtual worlds, digital television and digital cinema) is discussed through a historical exploration and critical analysis of the economics, technical innovations, social demands and ethical constraints that define it.

Having first provided a theoretical framework for discussing and classifying digital entertainment and convergence, the module provides an overview of theory and methods allowing the student to critically analyse and discuss key technical, business, ethical and regulatory issues associated with the commissioning, planning, production, distribution, payment for and use of digital entertainment by a variety of target groups. Activities will include the use of stakeholder and competition analyses, being able to formulate a business case and to handle in general terms the risk management of a given digital entertainment project.

ECOM6026. E-business and systems: analysis and strategic management (elective)

This module covers the fundamental concepts necessary for the in-depth analysis of e-business and the management of innovative e-commerce and information systems projects. It provides a framework of business analysis, the tools and methodology for process modeling and re-engineering, and the organizational/behavioral considerations for the successful adoption and implementation of e-business systems. It takes a holistic approach and lays the foundation for preparing professionals to manage e-business projects effectively.

ECOM6027. Internet and e-commerce security (elective)

This module provides an introduction on the technical issues concerning Internet and e-commerce security. It covers areas such as: protecting information using symmetric and public key cryptography; key management; trusted model and PKI; malware and common attack scenarios; system and database security; intrusion detection systems; Web security; mobile code security; authentication and handshake protocols. Topical issues such as phishing, spyware, cross-site scripting will also be discussed.

ECOM6028. Geo-spatial information for e-business applications (elective)

In this module, students learn the value of a spatial perspective in the business world and for the management of all land-based resources. Students will be introduced to the characteristics of geo-spatial information, how to access it over the web and to the technology (GIS) which is used to store, manipulate and analyse this information. They will also learn how spatial analysis can use this information to produce new information critical to informed business decision making. A brief introduction to visualizing spatial information and implementing GIS in business is also included. Finally, the range of possibilities for distributing GIS-enabled services over the web is explored.

ECOM6029. E-business transformation (core)

The advent of the Internet provided new opportunities for companies to exchange information, reach new markets and conduct business electronically. But companies soon realized that these benefits can be fully realized only if they could successfully integrate and synchronize all their inter- and intra-organizational processes.

This module highlights the major strategic and organizational challenges surrounding e-business transformation. It provides a roadmap for managers planning to transform their companies into an inter-networked enterprise where proprietary and shared infrastructures are used to link customers, suppliers, partners and employees to create superior economic value.

MASTER OF SCIENCE IN ELECTRONIC COMMERCE AND INTERNET COMPUTING (Internet Computing stream)

PROGRAMME STRUCTURE

The *IComp* programme offers participants with a technical background an opportunity to acquire expert skills and knowledge of the most important Internet technologies to enhance their professional development in order that they will play a vital role in the Internet world.

Modules for the Internet Computing (*IComp*) stream

Candidates must either select (a) 8 modules and a project; or (b) 12 modules. All selection will be subject to approval by the Programme Director.

(a) If candidates opt for the enrolment mode of 8 modules and a project, at least 5 modules must be from the *IComp* list below, the remaining 3 may be from the *ECom* list.

(b) If candidates opt for the enrolment mode of 12 modules without the project, at least 7 modules must be from the *IComp* list below, the remaining 5 may be from the *ECom* list.

Candidates may also in exceptional circumstances select at most 2 modules from the syllabuses for the degree of MSc(Eng) and that for the degree of MSc(CompSc), subject to approval of the Head of the Department or Course Co-ordinator concerned in accordance with the provisions of Regulation EC6(d).

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 therefore subject to change.

IComp Modules Available:

Cores (select at least 4 modules):

- Internet information engineering
- Internet infrastructure technologies
- Security programming and applied cryptography
- Systems programming for Internet client-server and P2P computing
- Website engineering

Electives:

- A practical introduction to business intelligence
- Data mining with applications in business and electronic commerce
- Digital assets and multimedia computing
- E-crimes: prevention, detection, and legal sanctions
- Smart card and RFID technologies
- The new telecommunications landscape: convergence to Internet protocol, seamless mobile communications, and new services
- Topics in Internet computing
- Wireless communications – from physical layer to systems

SYLLABUSES

ICOM6011. Project (4 modules)

ICOM6012. Internet infrastructure technologies (core)

This module provides a quantitative, technical coverage on the components which form the infrastructure of the Internet. Topics include: IP addressing and routing architectures; standard transport and application protocols; common LAN and multi-access control schemes; operating principles and internals of network entities; web-caching and load-balancing for webserver farms; Access and Backbone network technologies. We will discuss not only how the Internet works but also its design rationale and engineering tradeoffs.

ICOM6027. E-crimes: prevention, detection and legal sanctions (elective)

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, prevention, detection and legal sanctions. Topics covered include: trends in e-crimes; tools for committing e-crimes; technologies for detecting e-crimes; computer forensics; laws relating to e-crimes; and criminal sanctions.

ICOM6028. Security programming and applied cryptography (core)

This module provides an in-depth study on how to implement a secure system. It covers areas such as: secure coding, security models used by Java and .NET, basic principles of cryptography, implementation of cryptography algorithms and how to implement secure application using cryptography.

ICOM6029. Topics in Internet computing (elective)

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.

ICOM6030. Wireless communications – from physical layer to systems (elective)

As you may be aware, wireless communication is definitely a very hot topic in the coming few years and there are many different magic words today in the context of wireless communication. (e.g. GSM, GRPS, EDGE, W-CDMA, UMTS, bluetooth, WAP, circuit switched data, packet switched data, bearer services, ..etc). The course is targeted to give students a comprehensive overview of various technologies with appropriate depth covering from the most fundamental concepts of information and bandwidth, to high level wireless applications. The focus is on cellular systems and the concepts are explained in mostly qualitative manner without complex mathematical equations.

ICOM6031. Internet information engineering (core)

One of the benefits of the Internet era is the ease and speed at which information can be created, disseminated, and collected for both individuals and organizations. This voluminous data created by this digital revolution is made more complex when it is held on different systems and platforms, in different formats, and with different meanings. “Information Engineering” is one of the challenges facing e-business and government organizations as we move from this ad-hoc information frontier towards coherent and formalized information management structures, semantics, and interoperability. The outcomes include greater reach and more understandable information for business, government, and public purposes.

This module covers the architectural approaches of Information Engineering to analyse, model, design, and implement information-driven applications and services across the Web and other platforms. Effective Information Engineering is the key to interoperability across these systems and plays a leading role in the standardisation of information semantics within communities and across domains. This module will develop the critical skills to understand and use applied techniques in the development of information standards with a focus on modeling and semantics with advanced and emerging technologies.

ICOM6032. Data mining with applications in business and electronic commerce (elective)

Data mining focuses on identifying patterns using past transactions to discover relationships. By its very nature electronic commerce is able to generate large amounts of information and data mining methods are quite helpful for managers in turning this information into knowledge which in turns can be used to make better decisions. These 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 mining techniques can be applied to solve managerial problems in marketing and electronic commerce. The emphasis is on understanding and applying existing techniques using computer software tools. The set of data mining techniques and marketing problems that can be studied is immense; therefore our strategy will be to focus on popular techniques like decision trees, logistic regression, linear regression, and text processing methods. Each of these techniques is applied to a specific case study in which students will be asked to solve a business problem using the specified approach. The objective is for students to be able to generalize their experience in these settings to other problems using the same technique.

ICOM6033. Smart card and RFID technologies (elective)

This module provides an introduction to smart card and radio frequency identification (RFID) technologies and how to use the technologies for applications. The module is composed of two parts: smart card and RIFD. In the smart card part, an overview of different types of smart card will be provided, followed by a discussion of smart card applications in e-commerce, healthcare, transportation, and national identification. It also covers the detailed information on smart card architecture, standards, system level information, card programming, and Java card technology. Security, privacy, card management and application design are discussed. In addition, case studies on smart cards are also provided, particularly with a couple of examples from Hong Kong and China. In the RFID part, RFID concepts and fundamentals are introduced, including components of RFID systems, the design and architecture of RFID systems, RFID middleware functionality, RFID capabilities, RFID related standards, current applications of RFID in businesses, and RFID use cases.

ICOM6034. Website engineering (core)

This module will introduce the standards, the software technologies, and some good practices for implementing websites and web-based applications.

The topics covered will be organized into four parts: (1) Basic website development (system architecture, server-side and client-side technologies); (2) Building blocks of "Web 2.0" (rich Internet applications, RESTful web services, data feeds, data/service mashups, socialization); (3) Support for different languages and devices (internationalization, mobile clients); and (4) Website administration (data replication and caching, server clustering, search engine optimizations, traffic analysis and enhancements). This module will highlight the importance of open standards adoption and open-source technologies. It will also briefly discuss web security and project lifecycle and management.

ICOM6035. Systems programming for Internet client-server and P2P computing (core)

Targeted for students who are not familiar with contemporary programming methodologies for building Internet based services, this module covers fundamental technologies that are essential building blocks of traditional Internet services, multi-tier enterprise applications, and emerging P2P applications. Students will obtain a comprehensive overview as well as practical hands-on experience in working with several different system architectures.

ICOM6036. A practical introduction to business intelligence (elective)

Business Intelligence (BI) is rapidly becoming a standard practice by which enterprises attempt to improve business performance through better decision making. According to Forrester Research, Business Intelligence refers to the "design and implementation of infrastructure, processes, and best practices for data warehousing, integrating, reporting, and analyzing business information."

BI works by controlling and raising the quality of data gathered from a variety of sources allowing enterprises to gain deeper insights into the available information. Better insight into the data also means better alignment of important business decisions with corporate goals.

ICOM6037. The new telecommunications landscape: convergence to Internet protocol, seamless mobile communications, and new services (elective)

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, intervehicular 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.

ICOM6038. Digital assets and multimedia computing (elective)

This module is a research evidence-based introduction to multimedia digital assets, how they are input, produced, processed, transmitted, stored, archived, and retrieved through their associated metadata.

The module will address digital assets and multimedia from four main perspectives: use, production, distribution, and storage/archiving.

On completing the module, students will have an understanding of what multimedia computing entails. Through the use of demonstrations of the creation of a small sample of multimedia products containing 2D and 3D media, audio, video, and animation students will acquire familiarity with a number of popular professional tools, which they can then follow up in their own time if their personal interests and professional needs warrant it.