Master of Science in Information Technology
(International Programme)

Faculty of Information Technology

King Mongkut's University of Technology North Bangkok

Master of Science in Information Technology (International Programme)

1. Introduction

The Faculty of Information Technology was founded in 1996 and was first situated in Prachinburi Province. At the time, the Faculty only offered an international programme in information technology, which was designed in collaboration with Monash University, Australia. In 1999, the Faculty moved to the Bangkok campus to provide a wide range of graduate-level courses for professionals who are proficient in Information Technology. Principally, the Faculty offers educational services to meet the needs of the community and industries in Thailand. The Faculty also aims to help alleviate technical manpower shortage problems faced by Thai industry.

Above all, a policy of the Faculty of Information Technology is to provide its students with excellent education by means of advanced IT teaching systems such as online live lectures, knowledge management systems (KMS) and the state–of–the–art computer and network laboratories. Moreover, lecturers, staff and students are active in undertaking research as well as helping local communities with information technology.

University's Vision:
To guide KMUTNB professional science and technology

University's Mission:
- To supply qualified graduates to the society
- To encourage research and academic work
- To support public academic services
- To maintain national arts and culture

University's Identity:
Graduated with creativity and workability

University's Uniqueness:
University of Creative Invention to Innovation

Faculty's Vision:
Leading organisation in information technology education and research

Faculty's Mission:
- To produce graduates with quality and morality
- To develop well-known research
- To develop effective management system using information technology

Faculty's Identity:
On the technological frontier with analytical mind and practice

2. Curriculum Objectives

2.1 To produce internationally-renowned graduates with knowledge and expertise in information technology that is up-to-date with the advances in science and technology of today's world

2.2 To produce graduates who are capable of developing new knowledge and technology to help advance the world's information systems, and data communications and networks

2.3 To produce high-quality graduates with capabilities in information technology that meet the market needs

2.4 To produce graduates who are capable of developing research in information technology, software engineering, and data communications and networks

3. Employment Prospects

Many opportunities lies ahead of information technology graduates. These include system analyst, software developer, system administrator, information system auditor and consultant, software project manager and researcher in various fields of information technology.

4. Applicant Qualifications

4.1 Applicant must hold a Bachelor degree with at least 12 credits in information technology or any computer-related courses.

4.2 Applicant must have passed an official English test. The followings tests are accepted by the faculty: TOEFL with at least 477 marks or IELTS with at least 4.5 marks.

5. Programme Structure

The programme is categorised into two plans: Plan A and Plan B. The structure of each plan is as follows.

5.1 Plan A

5.1.1 Compulsory Courses			**24**	**Credits**
Core Courses	12	Credits		
Thesis	12	Credits		
5.1.2 Elective Courses			**12**	**Credits**
Branch Elective Courses	9	Credits		
General Elective Course	3	Credits		
		Total	**36**	**Credits**

5.2 Plan B

5.2.1 Compulsory Courses			**18**	**Credits**
Core Courses	12	Credits		
Master Project	6	Credits		
5.2.2 Elective Courses			**18**	**Credits**
Branch Elective Courses	12	Credits		
General Elective Courses	6	Credits		
		Total	**36**	**Credits**

6. Course Content and Credits

6.1 Core Courses

070125802 Quantitative Analysis 3 Credits

Scientific method in problem solving quantitative analysis roadmap, decision making procedure, type of decision, quantitative analysis techniques.

070125803 Information Modelling and Database System 3 Credits

Data storage structure, data level, information modelling, concepts of database systems, database system architecture, database design and case studies, middleware, relational algebra and concept of Structured Query Language (SQL), query processing, transaction management, database integrity and security, database management should demonstrate their abilities to apply the knowledge to effectively solve database related

problems. Students will also research published works in data modelling and database technology.

070125804 Computer Network 3 Credits

Computer data networking technologies. It includes an introduction to data communication and computer networking, theoretical basis for data communication, digital and analog data communication techniques, data encoding, data conversion and their standards, the open system standards, details and examples of practical implementations in each network layer of the OSI. Internet working techniques will also be introduced. The student will be familiarized with Internet and www applications and their protocols such as TCP/IP, IP, ICMP, TCP, UDP, SMTP, HTTP; gateway and routing protocols such as ARP, RARP, RIP, and OSPF protocols. The students are expected to be able to design practical corporate networks and know how to assign IP addresses to the network devices.

070125805 Research Methodology 3 Credits

Training for students to do individual work of literature reviews on research and academic papers on Information Technology. Students must do searching, reading, analyzing, synthesizing, and writing related to Information Technology topics with guidance from class advisors through an initial reading list concerning Information Technology and regular meetings during the semester. Students will be encouraged to go beyond that initial reading list. The selected topics by a student will be assessed on an oral presentation to staff and peer group and on a formal written report.

070125800 Thesis 12 Credits

This subject involves students will partake in individual advanced research work in information technology using formal research methodologies under the supervision of the thesis advisory committee. During the research process, students must defend their thesis with their advisory committee. After finishing the research, students must submit a final formal thesis report and then defend their thesis with a thesis examination committee.

070125801 Master Project 6 Credits

This subject involves studies on the subject of research. For students who do not want to do a thesis by the approach is to provide students with a graduate program, students must plan the project and pings are interested in topics related to information technology in the practical.

6.2 Branch Elective Courses (Information Technology Branch)

070125806 Data Warehousing 3 Credits

Data warehousing; definitions of terminology and purpose of a data warehouse; designing the data warehouse; data sourcing; implementing the data warehouse; delivery of data from the warehouse to the manager for decision support, organizational issues involved with designing and implementing a data warehouse and case studies of data warehousing practice.

070125807 Data Mining 3 Credits

Fundamental of data mining; tools for learning and statistics for data mining; knowledge representation from data mining; algorithms for data mining; learning evaluation with training data; decision trees; patterns classification; clustering; attribute selection; Web data mining; computer programming for data mining; application of data mining.

070125808 Fuzzy Systems and Artificial Neural Networks 3 Credits

Fundamental of fuzzy sets and logic; fuzzy relations; fuzzy implications; theory of approximate reasoning; fuzzy rule-based; fuzzy control systems; implementation and application of fuzzy systems; introduction to neural network; Perception learning rule; delta learning rule; least mean squared error learning rule; multilayer Perception network; back propagation learning method; associative learning; radial basis function networks; support vector machine; implementation and application of neural network; principle of combination of fuzzy and neural network.

070125809 Knowledge-Based System 3 Credits

Knowledge-based systems; the need of expert systems to overcome the shortage of experts; application of knowledge-based systems for decision support; knowledge - based systems design and structure; integration expert knowledge in system designs; building knowledge-based systems using various methods; applications of knowledge-based systems.

070125810 Semantic Technology 3 Credits

Semantic technology which covers make-up languages, XHTML and XML. XML describe DTDs, XML Schemas, XPaths, XSL, XSLT, XLinks and XPointers, including how to process an XML document with SAX and DOM. For the Semantic Web make-up languages, the course RDF, RDGS, OWL, and rule mark-up languages as well as reasoning with communication of Semantic Web information by intelligent agents.

070125811 Human Computer Interaction 3 Credits

Evolution of HCI, psychological characteristics of human related to human computer interaction (e.g. attention, memory, mental models, emotion, cognition, etc.), computer technology related to human-computer interaction (input technology, sensors, visual displays, etc.), designing interactions (e.g. user interface design, web design, etc.), methods for requirements specification (e.g. contextual inquiry, etc.), methods for design and development (e.g. prototyping, scenario-based design, etc.), methods for testing and evaluation (e.g. usability testing, etc.), and future trends in HCI.

070125812 Information Technology for Organization and Strategic Planning 3 Credits

Organizational and technical foundations of information systems such as information systems challenges and opportunities, strategic role of information systems, organizations and business processes, information, management and decision making, computers and information processing, information systems software, managing data resources, telecommunications, the internet and enterprise networking. Emphasis will be made on planning, and contemporary information systems building approaches to increase quality and productivity of an organization. Topics include systems concepts; systems classification and information concepts; information theory; decision processes; redesigning the organization with information systems; alternative systems-building methods; systems evaluation and selection; ensuring quality with information systems; systems success and failure; implementation; the key concepts in information technology strategic planning; IT strategic planning; and how the theory and practice of IT planning have evolved.

070125813 Software Metric 3 Credits

Software metrics; the basics of measurement; goal-based framework for software measurement; measuring internal product attributes; measuring external product attributes: quality, reliability, software test metrics, object-oriented metrics, measuring cost and effort.

070125814 Web and Database Management Systems 3 Credits

Data management and web based technologies; designing and developing of Dynamic Web Application, investigation and study in research issues and approaches using to model and develop Information Systems such as ASP.NET, PHP, XML and Web Service; management of Web Database; XML database Implementation; and connecting to a Web Service.

070125815 Performance and Auditing Information Technology Management 3 Credits

Framework of background and objectives of VFMA, operational auditing methods and techniques, major operational areas in IS, risks and control opportunities, economy of resource utilization efficiency determination of the key performance areas, the quantification of effectiveness implementing the VFMA audit program, performing the audit and following-up.

070125816 Business Intelligence Modelling 3 Credits

Principles, techniques and applications of computer based decision support models for business and industry. Topics include: decision trees; linear programming and optimization; other mathematical programming methods; waiting lines and queues; time series analysis and forecasting; inventory modelling and discrete-event simulation. Models will be built and in case problem is encountered will be solved using spreadsheets or other computer applications as appropriate.

070125817 Information Visualization 3 Credits

Design and presentation of digital information, use of graphics, animation, sound, and visualization software in presenting information to users, methods of presenting complex information, and incorporation of visualization techniques into interactive interfaces.

070125818 Decision Support Systems 3 Credits

Introduction to the development and use of information system in supporting management and decision making; the nature of management work and how this impacts the development of systems intend to support management decision making; a number of commonly used decision support modelling techniques; the examples of decision support systems.

070125819 Information Retrieval Systems 3 Credits

Information retrieval (IR) system technology; brief overview of problems in information retrieval; introduction to modern information retrieval; deterministic IR model; Boolean model; fuzzy set model; P-norm, vector space and Bayesian IR model; text analysis and automatic indexing; text languages and properties; multimedia IR: models and languages, indexing and searching; searching the Web; retrieval evaluation; user interfaces and visualization; digital libraries.

070125820 Selected Topics in Information Technology 3 Credits

Information Technology in order to gain benefit of the update technology in this field. These topics are different from other subjects in the IT curriculum.

070125821 Seminar in Information Technology 3 Credits

Training for students to do individual work of literature reviews on research and academic papers on Information Technology. Students must do searching, reading, analyzing, synthesizing, and writing related to topics of interest with guidance from class advisors

through an initial reading list concerning data networking and regular meetings during the semester. Students will be encouraged to go beyond that initial reading list. The selected topics by a student will be assessed on an oral presentation to staff and peer group and on a formal written report.

070125822 Information Security 3 Credits

Definition and the importance of information security, categories of threats, risk management, security technologies such as symmetric cryptography, asymmetric cryptography and hash functions, access control, methods of authentication, firewalls, intrusion detection systems, network security, computer and information security laws and ethics.

7. Graduation Requirements

7.1 Plan A

- Students must have at least a 3.00 GPA (in a 4.00 system)
- Students must propose and defend their thesis
- Students must have their research published either at an international conference or in an international journal.

7.2 Plan B

- Students must have at least a 3.00 GPA (in a 4.00 system)
- Students must take and pass a comprehensive examination
- Students must propose and defend their master project.

8. Programme Operation

8.1 The programme is operated in a semester system (two semesters per academic year).

8.2 The first semester begins in August and ends in January. The second semester begins in February and ends in May.

8.3 The programme is usually a two-year programme. However, students are allowed to take up to five years.

8.4 Classes are operated in the evening between 18:00 and 21:00, Monday to Friday.

8. Tuition Fees and Other Expenses

8.1 The tuition fee for the programme is 60,000 Baht per semester, which makes it 240,000 Baht for the whole programme (if students are able to graduate within four semesters).

8.2 Accommodation cost is usually around 2,000 – 4,000 Baht per month.

8.3 Registration fee for attending academic conferences or publishing in a journal is around 20,000 Baht per conference. (The Faculty also has some funding for students.)