



DOCTOR OF PHILOSOPHY PROGRAM IN INFORMATION TECHNOLOGY

■ FACULTY OF SCIENCE

DOCTOR OF PHILOSOPHY PROGRAM IN INFORMATION TECHNOLOGY

In today's knowledge economy, Information Technology plays a pivotal role in capturing all knowledge for processing and inventory in digital formats. The discipline is a science in its own right which emerged from Mathematics.

Our Ph.D. Program is offered with concentrations in a continuum of knowledge from Representation and Reasoning, more symbolic and philosophical, to Geo-informatics and GIS, the other extreme of applied technology to the physical world.

Research facilities/resources are provided for student access, namely, a graduate student research room, state of the art PCs and Macs capable of multimedia production and several laser printers, mobile devices (IOS and Android), on-line publishing resources, such as IEEE, ACM, Spring and/or Science Direct, and specialized library collections.

Research quality indicators are evident in the faculty publications in world-class journals, such as, *Expert System with Applications*, *IEEE Transactions Biomedical Circuits and Systems*, *IEEE Transactions on Multimedia*, *IEEE Transactions on Journal Microwave Theory and Techniques*, *IEEE Sensors*, and the *Journal of Computing in Civil Engineering*.

Faculty members consistently receive research grants from both internal and external funding agencies, for example, the National Research Council of Thailand.



Objectives

Desirable characteristics of graduates are as follows:

- Knowledgeable with in-depth understanding of principles and theories in Information Technology.
- Able to develop new innovation or create new knowledge beneficial to the profession.
- Skillful and competent in rational analysis and holistic thinking.
- Capable of analyzing and synthesizing data for solutions of academic and professional issues.
- Inquiry-minded and acknowledged as a leader in advanced technology of international standards.
- Responsible, ethical, and moral in functioning as an information technologist.

Admission

In accordance with the Graduate School Rules and Regulations. The program committee reserves the rights to require more qualifications as deemed appropriate.



Medium of Instruction

Thai and English

Research Focus

- Knowledge Representation and Reasoning
- Mobile Computing
- Business Intelligence for Enterprise System
- Technology for Community Development
- Geo-informatics and GIS
- Intelligent and Adaptive Systems
- Visual Information Processing
- Human Centered Computing

Requirement for Graduation

In accordance with the Graduate School's Rules and Regulations with added requirements.

Option 1

Publications of the dissertation or a part of it with at least three articles in the following:

- 1 – Journal in ISI database.
- 2 – Journal in ISI database or an international journal.
- 3 – Academic journal or presented in an international conference with peer-reviewed proceedings.

Option 2

Requirements of option 2.2 are the same as option 1. However, option 2.1 omits number 3. once.

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Structure of the Program

1. Credit Requirements. *

Requirements	Option 1.1	Option 2.1	Option 2.2
Coursework	-	12	24
Core Courses	-	6	18
Electives	-	6	6
Required Non-credit Courses	4	4	7
Dissertation	48	36	48
Total	48	48	72

* Minimum credits required.

2. Core Courses

Requirements	Option 1.1		Option 2.1		Option 2.2	
	Course No.	Credits	Course No.	Credits	Course No.	Credits
Managing Information Technology	-	-	269611	3	269611	3
Algorithms and Complexity	-	-	269641	3	269641	3
Information Systems and Project Management	-	-	-	-	269511	3
Advanced Database Systems	-	-	-	-	269516	3
Information Technology and Infrastructures	-	-	-	-	269514	3

Requirements	Option 1.1		Option 2.1		Option 2.2	
	Course No.	Credits	Course No.	Credits	Course No.	Credits
Information System Analysis and Design	-	-	-	-	269523	3
Total	0	0	0	6	0	18

3. Electives

Requirements	Option 1.1		Option 2.1		Option 2.2	
	Course No.	Credits	Course No.	Credits	Course No.	Credits
Information Modeling	-	-	269612	3	269612	3
Trust and Reputation for e-Business Intelligence	-	-	269613	3	269613	3
Special Topics in Advanced Information Technology	-	-	269618	3	269618	3
Special Topics in Advanced Information Technology	-	-	269619	3	269619	3
Risk Prediction and Management	-	-	269621	3	269621	3
Web Services for e-Business	-	-	269642	3	269642	3
Advanced Data Mining Techniques	-	-	269643	3	269643	3
Total	-	-	7	≥6	7	≥6

4. Required Non-credit Courses.

Requirements	Option 1.1		Option 2.1		Option 2.2	
	Course No.	Credits	Course No.	Credits	Course No.	Credits
Seminar I	269670	1	269670	1	655570	1
Seminar II	269671	1	269671	1	655571	1
Seminar III	269672	1	269672	1	656672	1
Seminar IV	269673	1	269673	1	656673	1
Research Methodology in Science and Technology	-	-	-	-	269593	3
Total	4	4	4	4	5	7

5. Dissertation Credit Requirements.

Requirements	Option 1.1		Option 2.1		Option 2.2	
	Course No.	Credits	Course No.	Credits	Course No.	Credits
Dissertation I, Type 1.1	269680	6	-	-	-	-
Dissertation II, Type 1.1	269681	6	-	-	-	-
Dissertation III, Type 1.1	269682	9	-	-	-	-
Dissertation IV, Type 1.1	269683	9	-	-	-	-
Dissertation V, Type 1.1	269684	9	-	-	-	-
Dissertation VI, Type 1.1	269685	9	-	-	-	-
Dissertation I, Type 2.1	-	-	269690	3	-	-
Dissertation II, Type 2.1	-	-	269691	6	-	-
Dissertation III, Type 2.1	-	-	269692	9	-	-
Dissertation IV, Type 2.1	-	-	269693	9	-	-
Dissertation V, Type 2.1	-	-	269694	9	-	-
Dissertation I, Type 2.2	-	-	-	-	269674	6
Dissertation II, Type 2.2	-	-	-	-	269675	6
Dissertation III, Type 2.2	-	-	-	-	269676	9
Dissertation IV, Type 2.2	-	-	-	-	269677	9
Dissertation V, Type 2.2	-	-	-	-	269678	9
Dissertation VI, Type 2.2	-	-	-	-	269679	9
Total	-	48	5	36	6	48

Course Descriptions

269511 Information Systems and Project Management 3(2-2-5)

A study of the following: current and future trends of information systems and information technology, meaning, components, and types of management information systems in organisations; theories relating to organisations and information systems; information systems development; information technology infrastructure; network and database management systems; e-commerce; the relationship between information technology and business strategy; project management information systems; and ethical and social issues in digital organisations.

295514 Information Technology Infrastructures 3(2-2-5)

Information technology infrastructure in the aspects of systems architecture, data communications, and networks; enterprise information infrastructure; multinational enterprise infrastructure; layered network architecture; network and communications protocols; global WAN services; web services; enterprise network design; wireless technologies; and network security and management.

269516 Advanced Database Systems 3(2-2-5)

Relational database design principles, database implementation and tools, advanced SQL, database systems catalogue, query processing and evaluation, transaction management and recovery, database security and authorisation; distributed databases, object oriented databases, databases and XML, and examples of DBMS architectures.

269523 Information System Analysis and Design**3(2-2-5)**

The principles, processes, models, tools, and techniques of system analysis and design; the use of data flow diagrams, data dictionaries, data processing explanations, file and data base design as well as user interface design; and the use of Unified Modeling Languages (UML) and their diagrams, class definitions, data modeling, system development system quality, and evaluation.

269593 Research Methodology in Science and Technology 3(3-0-6)

Research definitions, characteristics, and goals; research processes; research problem determination; variables and hypotheses; data collection; statistical data analysis; writing literature reviews and thesis proposals; research evaluation; research application; research ethics; and writing standard format reports.

269611 Managing Information Technology**3(3-0-6)**

New organisational structures and strategies, virtual organizations, e-commerce, organisational transformation, managing IT driven change, decision and executive support systems, groupware, networked organizations, data mining, customer relationship management and enterprise resource planning, the impact of information technology on an organization, and the issues concerned with IT related change.

269612 Information Modeling**3(2-2-5)**

Internet information modeling, modeling techniques, the web space method, ontology extraction and conceptual modeling for web information, and web application quality.

269613 Trust and Reputation for e-Business Intelligence 3(2-2-5)

The following concepts will be studied: trust, trust relationships, trustworthiness, trust value, trustworthiness value, trustworthiness measures and trustworthiness prediction, reputation, reputation value and measure, including a detailed analysis of the dynamic nature of trust and reputation and concept specificity, the time dependent nature of trust and reputation, existing business intelligence tools, and how to apply them.

269618 Special Topics in Advanced Information Technology 3(3-0-6)

Special topics in advanced information technology to be chosen by the instructor and which may vary from term to term.

269619 Research topics in Advanced Information Technology 3(3-0-6)

A research topic in advanced information technology which contains deep knowledge in a particular research topic which will be chosen by the instructor or advisor and which may vary from term to term.

269621 Risk Prediction and Management 3(3-0-6)

A risk model for risk prediction and measurement used for decision making, risk analysis for a particular peer in a virtual environment, and predicting the level of risk between peers involved in the transaction.

269641 Algorithms and Complexity 3(3-0-6)

Analysis of the complexity of algorithms for upper and lower bounds; revising problems, such as sorting, searching, and graphs; recursive algorithms; applying and coding recursive algorithms with web based programming language algorithms for network flow problems and complexity; cryptography; and NP-completeness problems.

269642 Web Services for e-Business**3(2-2-5)**

The concepts of web services, the fundamental characteristics of web services architecture and the benefits of this approach, and a solution oriented elaboration of several significant aspects of web services for e-business.

269643 Advanced Data Mining Techniques**3(2-2-5)**

Data preparation and processing, dimension reduction, multiple regression models, logistic regression naïve Bayes and Bayesian networks, and genetic algorithms and neural networks.

269670 Seminar 1**1(0-2-1)**

Practice in searching, reading, analytical thinking, and giving oral presentations of research articles of current interest in information technology.

269671 Seminar 2**1(0-2-1)**

Presentation and discussion of interesting research in theoretical or applied information technology.

269672 Seminar 3**1(0-2-1)**

Presentation and discussion of current research in different fields of information technology in the area of the dissertation.

269673 Seminar 4**1(0-2-1)**

Practice in writing and presenting research in information technology.

269674 Dissertation 1, Option 2.2**6 Credits**

Knowledge and research articles on topics of interest, creating guidelines and frameworks for research, undertaking a literature review of various data bases comprising fundamental hypotheses, and writing a summary report of research and progress.

269675 Dissertation 2, Option 2.2**6 Credits**

Compilation of further information, the allocation of guidelines and frameworks for research, and a summary report of research and progress.

269676 Dissertation 3, Option 2.2**9 Credits**

Establishing research hypotheses, conducting research within guidelines and frameworks, and writing a summary report of research and progress.

296677 Dissertation 4, Option 2.2**9 Credits**

Conducting research within allocated guidelines and frameworks, preparing a thesis proposal, and writing a summary report of research and progress.

269678 Dissertation 5, Option 2.2**9 Credits**

Reviewing the research, preparing research articles in the information technology field and making any necessary modifications based on expert opinions, and presenting a summary report of the research and progress.

269679 Dissertation 6, Option 2.2**9 Credits**

Completing a dissertation defense, making any corrections required by the examiners, and submitting a report to the Graduate School.

269680 Dissertation 1, Type 1.1**6 Credits**

Undertaking a literature review of various data bases comprising fundamental knowledge and research articles on topics of interest, creating guidelines and frameworks for establishing hypotheses, and writing a summary report of research and progress.

269681 Dissertation 2, Option 1.1**6 Credits**

Compilation of further information, allocation of guidelines and frameworks for research, and a summary report of research and progress.

269682 Dissertation 3, Option 1.1**9 Credits**

Establishing research hypotheses for conducting research within guidelines and frameworks and presenting a summary report of the research and progress.

269683 Dissertation 4, Option 1.1**9 Credits**

Conducting research within allocated guidelines and frameworks, preparing a thesis proposal, and writing a summary report of research and progress.

269684 Dissertation 5, Option 1.1**9 Credits**

Reviewing the research, preparing research articles in the information technology field, making any necessary modifications based on expert opinions, and presenting a summary report of the research and progress.

269685 Dissertation 6, Option 1.1**9 Credits**

Defending the dissertation, make any corrections or modifications according to the examiners' comments, and submitting the final dissertation to the Graduate School.

269690 Dissertation 1, Option 2.1**3 Credits**

Undertaking a literature review of various data bases comprising fundamental knowledge and research articles on topics of interest to create guidelines and frameworks for consideration of possible research; and writing a summary report of research and progress.

269691 Dissertation 2, Option 2.1**6 Credits**

Compilation of further information, allocation of guidelines and frameworks for research, and writing a summary report of research and progress.

269692 Dissertation 3, Option 2.1**9 Credits**

Establish research assumptions, conducting research according to allocated guidelines and frameworks, presenting a dissertation proposal, and writing a summary report of the research and progress.

269693 Dissertation 4, Option 2.1**9 Credits**

Reviewing the research, preparing research articles in the information technology field and making any necessary modifications based on expert opinions, and presenting a summary report of the research and progress.

269694 Dissertation 5, Option 2.1**9 Credits**

Preparing and defending the dissertation, making any corrections or modifications according to the examiners' comments, and submitting the final dissertation to the Graduate School.