



教學卓越計畫
Teaching Excellence and Learning Autonomy

A6-3-1 課程網頁國際化之建置－授課目標

系所：資訊科技研究所

學程：博士

Course Descriptions of Graduate Program
Graduate Institute of Informatics, Doctoral Program

Code	Credits	Course Name	Course Description
DI7220	3	Knowledge Management	This class provides a framework for clarifying knowledge management, also managing and maximizing the return on knowledge assets.
DI7221	3	Advanced Database Management System	This course will introduce the advance of DBMS; especially focus on the corresponding techniques and environments. Examples are concurrency control, recovery mechanism, query processing, etc. Also discussing the distributed database, object-oriented database, spatial database, temporal database, multimedia database, and data warehousing.
DI7222	3	Software Engineering	This course will cover various advanced topics of software engineering, including software development models, software project management, real time and distributed software development techniques, software testing techniques, software maintenance issues, and software re-engineering.
DI7223	3	Electronic Commerce	Electronic commerce (EC) is emerging as a new type of business transactions. To guide students into this great area of research, this course is designed to introduce students to acquainted with the past and the future development of electronic commerce, and various IT research issues that are related to the development of electronic commerce. The tentative topics to be covered in this courses are, but not limited to, the followings: <ol style="list-style-type: none"> 1. The basics of EC, 2. The network infrastructure for EC, 3. Security and EC, 4. Business-to-Consumer EC 5. Business-to-Business EC and XML/EDI 6. Consumer Search and Resource Discovery

			7. Introduction to Mobile Commerce.
DI7224	3	Collaboration E-Learning	The goal of Collaboration E-Learning is to establish a source of new knowledge for students. However, in domestic and international research regarding E-learning mainly focused on the infrastructure of computing environment but the lack of comprehension for studying. In the distant collaboration, the difference generated by different background is variant, and it is not beneficial to positive learning effect. To avoid that situation, this course focuses on the synchronization of related education theory and computing infrastructure. Based on this, we discuss the study method while people exchange knowledge in collaboration system, and build an e-learning model.
DI7225	0	Speeches in Information Technology	1.This course is designed to promote student's competent in information science and engineering. 2.This course will provide students for research communication, academic exchange and enterprise experience with scholars, researchers and experts.
DI7202	3	Wireless Networks	PCS, GSM, GPRS Wireless LAN, Mobile IP, Bluetooth 3G Mobile Systems Beyond 3G Mobile Systems Mobile Ad Hoc Networks Wireless Sensor networks.
DI7203	3	Operating System	1. Review the kernel functions of operating systems) 2. Modeling and analyzing the concepts of operating systems) 3. Study the management and design of an operating system)
DI7212	3	Algorithms	This course investigates several important algorithm topics. The covered issues in this course includes 1.Complexity of algorithms and lower bounds of problems. 2.NP-complete. 3.Greedy method. 4.Divide-and-conquer. 5.Tree searching strategies. 6.Prune-and-search strategy. 7.Dynamic programming.
DI7213	3	Digital Communications	Tentative topics covered in this course include digital image fundamentals, mathematical preliminaries of two-dimensional systems, image

			transforms, human perception, color basics, sampling and quantization, compression techniques, image enhancement, image restoration, image reconstruction from projections, and binary image processing.
DI7214	3	Advanced Computer Networks	This course will provide an up-to-date survey of current developments in high speed networks. We will cover the multimedia, congestion control, and QoS issues based on the Internet Protocol, the entire TCP/IP protocol suite, and ATM networks.
DI7219	1	Informatica Project Discussion	The objective of the course is to let our graduate students in Pd.D. degree can fast focus on different fields of information technology and research. In addition, it will help student to understand how to make a good presentation of paper of computer science in English.
DI7401	3	Fuzzy Theory and Application	The goal of this class is to introduce the fuzzy set theory and its corresponding applications. The important topics includes logic concepts, set theory, fuzzy set theory, fuzzy relation, fuzzy mathematics, fuzzy logics , fuzzy inference rules, fuzzy logic control and other important theories and their applications.
DI7403	3	Distributed Systems	This course is aimed at discussing the topic of parallel and distributed systems. The following topics will be covered in this class: Parallel and Distributed System Architecture, Parallel and Distributed Computing, Internet Computing, Cluster Computing, Grid Computing, and Mobile Computing.
DI7415	3	Multimedia Information Processing and Classification	The course introduces about important design techniques and tools of multimedia system design, its goal is to train the students for implementing a practical multimedia program. The content of this course includes the concept of multimedia, the script design, the processing of image, audio and video, the animator design, the interactive design, etc.
DI7227	3	Advanced Supply Chain and Logistics Management	The course is an extension from the courses related to logistics management. We will, in the course, discuss advanced topics related to supply chain managements. These advanced topics covers strategy, planning, and executing in the supply

			chain management. The primary goals of the course are : Introducing the knowledge and problems in the supply chain management; and Teaching students how to formulate the problems and to solve these problems by the mathematical tools in the fields of operation research and decision science.
DI7228	3	Information Science and Technology Management	Introducing the integration and application of information technology and management such like E-Commerce, Enterprise Resource Planning, Customer Relationship Management, Supply Chain Management ...etc.
DI7229	3	Multiple Criteria Decision Making	This course will introduce a series of multiple criteria decision making (MCDM) methods and applications. The goal of this course is to help students gain a deep practical and theoretical insight into the MCDM methods, so as to correctly apply them to solve complex decision making problems. There are two main streams of MCDM: 1. Multi-Objective Decision Making, which assumes continuous solution spaces and tries to determine optimal compromise solutions. 2. Multi-Attribute Decision Making, which solves problems with countable few decision alternatives and basically uses approaches from discrete mathematics. The main focus of this course is on the Multi-Attribute Decision Making stream and few approaches in Multi-Objective decision Making. Team works and real case studies will be emphasized in assignments and final term project.
DI7230	3	Multivariate Analysis	This course consists of several issues in relation to multivariate analysis: principle analysis, factor analysis, classical correlation analysis, discriminant analysis, cluster analysis, multivariate analysis of variance, reliability and validity analysis.
DI7231	3	Advanced Management Information Systems	The major subjects of this course are as follows: Management Information System (MIS), an integrated system based on computer and information technology, provides organizations with information for supporting routine works and decision activities. Organizations are able to achieve various goals through decision-making procedures with the assistance of management

			<p>information systems. This course takes representative articles from several domestic/international MIS-related journals. The objective is to study the employment of information technology, considering aspects from organizations and systems, for different levels of organizations. Topics comprise of Accounting Information Systems, Decision Support Systems, Knowledge-based Information Systems, Executive Information Systems, Market Information Systems, Production Information Systems, Financial Information Systems, Human Resource Information Systems, Information Resource Information Systems, Strategic Management Information Systems and Electronic Commerce. Through the discussions on MIS articles, the purpose of this course is to have an in-depth understanding about the issues, methodologies and trends of information management researches.</p>
DI7204	3	Source Coding	<p>This course will introduce Convolutional codes, Trellis of Linear Block Codes, Decoding of Codes, Factor Graphs, Turbo Codes, Multilevel Concatenated Codes, and Coded Modulation.</p>
DI7205	3	Agent Systems	<p>This course will introduce agent systems and multi-agent systems. Topics will include the concept of agents and multi-agent systems, the model of agents, the interaction of agent and environment, cooperation, coordination, and negotiation of multi-agent systems.</p>
DI7207	3	Queueing Theory	<p>Understand the general principles of how queues operate, how to use models to analyze queuing phenomena and develop queuing solutions.</p>
DI7404	3	Image Processing	<p>1.Introduction. 2.Images and Matlab. 3.Image Display. 4.Point Processing. 5.Neighborhood Processing. 6.Image Geometry. 7.The Fourier Transform. 8.Image Restoration. 9.Image Segmentation. 10.Mathematical Morphology. 11.Image Topology. 12.Shapes and Boundaries. 13.Color Processing. 14.Image Coding Compression.</p>
DI7405	3	Data Mining	<p>Data Mining and Knowledge Discovery has become an active area of research, attracting people from several disciplines, including database</p>

			<p>systems, statistics, information retrieval, pattern recognition, AI/machine learning, and data visualization.</p> <p>The course will introduce data mining and data warehousing, and study their principles, algorithms, implementations, and applications.</p> <p>TOPICS:</p> <p>An introduction to data mining and data warehousing: motivation and applications. Basic data warehousing technology: data cube methods, data warehouse construction and maintenance. Basic data mining techniques: characterization, association, classification, clustering, and similarity-based mining.</p> <p>Advanced data mining applications: mining relational and transaction data, mining time-related data, spatial data mining, textual data mining, multimedia data mining, visual data mining, and Web mining.</p>
DI7407	3	Neural Networks and Its Applications	<p>The course objective is to let graduate students understand the concept of artificial neural network(ANN) and its models. Graduate students will learn how to construct and apply ANN to their interested research area. Paper study and project implementation of one or more neural network models are required to fulfill this class.</p>
DI7232	3	Information Hiding	<p>Two main topics will be discussed in this course: steganography and digital watermarking. There has been a number of information hiding techniques since the development of human civilization, for example, invisible characters written with special ink, information hidden via rearrangement of the words in a seemingly normal article, and information hidden in microfilms, etc. How will these techniques be implemented in the digital era? How to transmit secret messages through the Internet without causing any notification? On the other hand, hand written signatures were usually used in the past to assert the copyrights of intellectual properties. As they are obviously infeasible for digital products, how to protect the products' integrity and copyright, especially when they can be easily modified? These types of digital</p>

			problems will be fully discussed in this course. Information hiding is a new area which combines research areas of image processing, information security, information theory, statistics, and so on. It is a new and interesting research topic.
DI7233	3	Enterprise Resource Planning(ERP)	This course examines the concepts of enterprise resources planning (ERP), business process management, implementation issues and organizational benefits of ERP systems. Features of ERP (sub-) systems in general, and those of a specific ERP product, are to be discussed.
DI7234	3	Digital Rights Management	Digital Rights Management (DRM) refers to protecting ownership/copyright of electronic content by restricting what actions an authorized recipient may take in regard to that content. This course covers the fundamentals of DRM systems including identifying, tracking, authorizing and restricting access to digital media. Coverage includes fundamentals of DRM systems, intelligent property rights, digital content distribution, managing the use of digital assets, and related protocols and standards. A number of advanced topics will be covered, including mobile DRM and hacking methods.
DI7235	3	Process Improvement Methodologies	This course aims to introduce Six Sigma history, theory, analysis techniques and related software. “Green Belt training program” will be the core of this class. By analysis of theory and illustration of real cases, this course helps student develop the skills of Six Sigma to improve critical processes dramatically.
DI7209	3	Multimedia Communications	This course will introduce: TCP/IP, QoS, optical fiber, multimedia network, and IPv6.
DI7215	3	Technique on Electronic Commerce	Electronic commerce (EC) is emerging as a new type of business transactions. To guide students into this great area of research, this course is designed to introduce students to acquaint with the past and the future development of electronic commerce, and various IT research issues that are related to the development of electronic commerce. The tentative topic to be covered in this courses are, but not limited to, the followings: 1. The basics of EC, 2.

			The network infrastructure for EC, 3. Security and EC, 4. Business-to-Consumer EC 5. Business-to-Business EC and XML/EDI 6. Consumer Search and Resource Discovery 7. Introduction to Mobile Commerce.
DI7216	3	Mobile Communication	This course is designed to teach students various technologies for wireless networks. The topics discussed in the course include (1) Wireless LAN and its research in 802.11, WLAN security, (2) GPRS wireless network, (3) Wireless Application Protocol (WAP) and (4) Bluetooth Issues and Applications.
DI7408	3	Broadband Network	The course introduces about important transmission techniques of Broadband Network: Asymmetric Digital Subscriber Line and Cable Modem.
DI7409	3	Parallel Computing	Applications with large computational requirements and data-intensive applications are rapidly evolving in many scientific domains. For this reason, parallel computing is gaining attention and is an area of interesting study. Different types of parallel systems are available to users. We deal not only with common parallel-processing problems but also with issues that have emerged in high-performance computing.
DI7416	3	Graph Theory	The concept of Notation and representations, Paths and searching, Trees, Networks, Cycles and circuits, Planarity, and Matching.
DI7417	3	Pattern Recognition	1.Classifiers based on Bayes decision theory, 2.Linear/nonlinear classifiers, 3.Feature selection, 4.Feature generation, 5.Context-dependent classification, 6.System evaluation, 7.Clustering algorithms.
DI7226	3	Software Quality Management	The course will cover methods and tools for achieving software quality assurance at various levels of a software system including at the module, subsystem, and system levels. State of the art tools and techniques including inspections, version control, and configuration management will be covered. Also, the role of standards, policies, and procedures will be discussed. The course will prepare students to develop a software quality assurance program in structured, organized ways. This course should provide practical knowledge of

			a variety of quality assurance techniques, and an understanding of some of the tradeoffs between techniques.
DI7210	3	Networking Security	Cryptography concept, security protocol, attack, firewall practice.
DI7217	3	Mobile Communication	The course introduces about important transmission techniques of mobile communication: Mobile Ad-hoc Network, Blue Tooth, IR, Wireless Sensor Network, etc.
DI7406	3	Virtual Reality System	Introduction to computer graphics and the application of virtual technology.
DI7418	3	Multimedia Database	In this class, we will introduce the principle of multimedia database systems which consist of indexing, retrieving, and storing the data of image, document, video, and audio.
DI7419	3	Digital Signal Processing	1. Signals and signal processing, 2. Discrete-time signals and systems in the time-domain, 3. Discrete-time signals in the transform-domain, 4. Applications of digital signals processing, 5. 2-D digital signal processing, 6. High pass and low pass filters, 7. Wavelet transforms, 8. Pattern recognition schemes.
DI7420	3	Knowledge Engineering	This course is based on artificial intelligence system. The purpose of the course will let students have ability to transfer human knowledge to machine reasonable knowledge. The content includes: knowledge-based intelligent systems, rule-based expert system and uncertainty management, first order and high order logic, fuzzy expert model, frame-based expert system and blackboard system, case reasoning, evolutionary computation, neural network, hybrid intelligent system, data mining and knowledge discover and semantic web primer discussion.
DI7421	3	Cryptography	This course is an introduction to the basic theory and practice of cryptographic techniques used in computer security. The students will realize the following important topics after finishing this course: Number theory, Symmetric Cryptosystem (DES, Triple DES, AES), Public-key Cryptosystem (DH, RSA, DSS), secure hash function (MD5, SHA), and digital signature et al.. Moreover, the Internet security and electronic commerce are also

			include in this course. Finally, some recent papers will be discussed.
--	--	--	--