A6-3-1 課程網頁國際化之建置－授課目標

系所：資訊工程系

學程：學士

Course Descriptions of Undergraduate Program

Department of Computer Science and Information Engineering

Code	Credits	Course Name	Course Description
CS1002	3	Introduction to Computers	The two main objectives of this course are (1) to give the students a guideline to technical writing which involves writing styles and skills in research papers and scientific reports, and (2) to help the student to improve reading and writing skills. The contents of this course include: (1) the purpose and principles of technical writing, (2) a general pattern for research papers and scientific reports, (3) the writing schemes for Abstract, Introduction section, Method section, Results and Discussions section, and Conclusion section.
CS1003	3	Physics	The goal of this course is to learn how to read and present a journal paper related to his research field. Writing reports and questions are also needed in this class.
CS1004	3	Digital Systems	New material knowledge, new techniques, and new thought in different field would be expected to bring to our students here by sharing research results and experience of invited researchers and teachers from other organizations.
CS1005	3	Calculus(I)	The goal of this course is to learn how to read and present a journal paper related to his research field. Writing reports and questions are also needed in this class.
CS1009	3	Computer Programming	New material knowledge, new techniques, and new thought in different field would be expected to bring to our students here by sharing research results and experience of invited researchers and teachers from other organizations.
CS1006	3	Assembly Language	The goal of this course is to learn how to read and present a journal paper related to his research field. Writing reports and questions are also needed in this class.
CS1007	3	Electronics	The goal of this course is to learn how to read and present a journal paper related to his research field. Writing reports

			and questions are also needed in this class.
CS1008	3	Calculus(II)	This course covers the key aspects of software engineering and Development. Topics include: system engineering, software process, system modes and UML, object-oriented design, software requirement, and software testing. On completion of this course, students should be able to perform the following tasks: 1. understanding the principles of software engineering; 2. understanding different development stages/models; 3. understanding and experience in writing requirements and specifications; 4. understanding and experience in designing and rapid prototyping; 5. understanding large scale software maintenance; 6. understanding general CASE tools and experience with particular CASE tools.
CS2002	3	Linear Algebra	The goal of this course is to study the structure of parallel computing and to design the parallel pargrams. After completing this course, students will realize the following topics: (1)The platform of parallel computing; (2)The principle of designing parallel algorithm; (3)Basic parallel communication opeartions; (4)Analytical modeling of parallel programs; (5)Programming using the message passing paradigm; (6)Programming shared address space platforms; (7)Parallel algorithms and applications - Dense Matrix Algorithms, Sorting, Graph Algorithms,Dynamic Programming, etc.
CS2094	3	Object-Oriented Programming	The goal of this course is to provide the students with a basic knowledge of pattern recognition. The students will realize the following concepts in the course: 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
CS2003	3	Data Structure	The course is aimed to study the related knowledge about graphs. After finishing the course, students will realize the following knowledge: (1)Basic introduction to graphs; (2)The related problems about graphs; (3)Graph algorithms; (4)The basic graphs; (5)Some special graphs and the algorithms on them; (6)The applications to graphs.

CS2004	3	Computer Networks	This course is aimed at introducing Object Oriented Programming . The following topics will be covered in this course: 1.Object-Based Programming （1）Object concept （2）Define Classes （3）Overloading 2.Object-Oriented Programming （1）Inheritance （2）Encapsulation （3）Polymorphism
CS2006	3	Engineering Math	This course gives an introduction to the concepts of mobile computing. Topics to be covered are: cellular networks, wireless networks, mobile application, security, and energy-effective issues. The students will realize the following mobile computing basics after finishing this course: 1. realize the operation of wireless networks, such as channel allocation, multiple access, handoffs, or location management; 2. understand the operation of various protocols, such as MAC protocol, routing, or Ad-hoc networking; 3. develop mobile applications, such as mobile agent, or data broadcasting.
CS3003	3	Microprocessor System	To provide a rigorous mathematical framework for two general areas: that of language description and that of computation; to examine the relation between the two and to consider practical applications from Computer Science and Linguistics.
CS3090	0	Programming Ability	The content contains the basic probability concept, discussion and analysis of such various kinds of random procedures as Poisson procedure, Renewal procedure and discrete-time Markov Chains,etc..
CS2005	3	Computer Organization & Architecture	The goal of this course is to provide students with a basic knowledge of the Electronic Commerce (i.e., EC). The main topics include EC introduction, Network protocols of EC, EC Applications, Secure EC, and Flows in EC. Students will realize the following backgrounds of this course after completing the course: 1. The function of the technology of EC; 2. The Applications and Flows in EC; 3. The secure EC; 4. Build an EC web system with the advantages of secure and flows.
CS3001	3	Introduction to Operating Systems	The goal of this course is to provide the students with a basic knowledge of Internet Technologies. The students

			will realize the following high speed network technologies after finishing this course: 1. High Speed Network Concept 2.Fast Ethernet 3.Gigabit Ethernet 4.FDDI Network 5. ATM Network 6. High Speed Wireless Network
CS3002	3	Probabilities and Statistics	The goal of this course is to provide students with a basic knowledge of the wireless networking. The main topics include wireless networking introduction, Physical Layer of Wireless Networks, Data-link Layer of Wireless Networks, Network Layer of Wireless Networks, and Handoff and Mobile IP of Networks. Students will realize the following backgrounds of this course after completing the course: 1. The function of the lower three layers of wireless network; 2. The operation of inter-layer in wireless networks; 3. Understand the operation of protocols in wireless networks; 4. Understand the algorithms and concepts of layered protocols in wireless networks.
CS3004	3	Discrete Mathematics	This course provides an overview on distributed system design issues,such as IPC, RPC, distributed file system, transactions,fault tolerance and distributed object technology.
CS3091	1	Special Project (I)	The goal of this course is to provide students with a basic knowledge of the queueing theory. The main topics include Probability introduction, Queueing introduction, Markov processes, Various Markov process and the state probability determination, and Simulation modeling and analysis. Students will realize the following backgrounds of this course after completing the course: 1. The function of Queueing system; 2. Discrete and Continuous Markov chains; 3. The determination of state probability of each state of Markov processes; 4. Simulation modeling and analysis.
CS3005	3	Introduction to Algorithms	This course will introduce the fundamentals of computer algorithms that support to study and provide feasible solutions for the related topics on bioinformatics.
CS3092	1	Special Project (Ⅱ)	Introduction to Random Variables, Random Processes, Distribution, Entropy, Relative Entropy, Conditional

			Entropy, Mutual Information, Channel capacity, and Gaussian Channels.
CS3093	1	Special Project (III)	The purpose of this course is to let students find out about the basic structure and application of the multimedia communication. The contents of the course include lossless data compression, lossy data compression, static image compresses standard, speech and audio compresses standard, video coding and Multimedia network.
CS1010	1	Information Ethics Lecture	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.
CS2202	3	System Programming	The goal of this course is to provide the students with a basic knowledge of the system programming. The main topics include assembly languages, assemblers, linking loaders, macro processors, compilers, and on-line debuggers. The students will realize the following topics after finishing this course: 1 the concepts of the machine oriented programming environment, 2. the concepts of system programming, 3. the techniques of the basic system programs.
CS2203	3	Windows Programming	The objective of this course is using C++ to write window programs that are execting in Windows system.
CS2204	3	Java Programming and Application	The central theme of the course is to introduce object-oriented programming using Java. Students will learn the basics of Java language constructs, object- oriented programming, graphics, event- driven programming. Gain practical experience of creating and modifying Java applications and applets, and embedding Java applets in HTML files. Upon completing the course, students will able to - Know the advantages of Java over other programming languages and the significance of Java to the Internet. - Become familiar with Java language constructs including decision statements, loop statements, methods, and arrays. - Program with classes and objects and use class inheritance.
CS2209	3	Linux/Unix System	This course starts from the basics, explaining how to install

			and manage the Linux hard disk, processes, and packages for Linux system. Topics to be covered are: 1.Introduction 2.Host layout and install 3.File, directory and Hard disk management 4.Vim text editor and shell scripts 5.Users management 5.Processes management 6.Multi-Boot Configuration 7.Packages management 8.Kernel compiling
CS2401	3	Electronic Circuits	The objective of this course is to develop a comprehensive understanding of the basic concepts involving the design and analysis of electronic circuits. The course outline is as follows：Frequency Response, Differential Amplifier, Current Mirror, Oscillator Circuit, Feedback Circuits, Filter, Power Amplifier and CMOS Logic Families.
CS2402	3	Programmable IC Design	The goal of this course is to provide the students with a basic knowledge of FPGA design. By giving appropriate project assignments, the course helps the students experience the whole FPGA design flow. After finishing this course, the students may learn the following: 1. basic concepts for digital circuits design, 2. the application of XILINX ISE, 3. a brief introduction to VHDL, and 4. projects implementation.
CS4410	3	Introduction to RFID	The technology of Radio Frequency Identification (RFID) has been widely applied in the various industries. The objective of the course is to introduce the basic elements for applying RFID technology to industries. These basic elements will include the RFID system framework and devices, various standard for applying RFID, and the application of the RFID technology.
CS2205	3	System Analysis And Design	This course provides the fundamental knowledge of systems analysis and design. The students will realize the following systems analysis and design after finishing this course, especially about the technique and method of an information software system's development： 1. Learn how to construct an information system. 2. Learn how to conduct the system analysis. 3. Learn how to manage a project. 4. Learn how to develop, testing and evaluate a system.
CS2206	3	Database Systems	The goal of this course is to provide the students with a

			basic knowledge of database system. The main topics include data modeling, structure query language, storeage structure, query processing, and transaction management. The students will realize the following database system basics after finishing this course: 1. the role of database and database applications in an organization; 2. data modeling using the entity-relationship models (E-R models); 3. developing database application; 4. understand the use of SQL
CS2207	3	Numerical Methods	The goal of this course is to provide students with a basic knowledge of the Numerical Methods. The main topics include Numerical Methods introduction, Numerical and Analytical solutions, Error and accuracy of Numerical methods, and Various important NUmerical methods. Students will realize the following backgrounds of this course after completing the course: 1. The difference of Numerical and Analytical solutions; 2. The numerical methods for Roots of Equations; 3. The numerical methods for Linear Algebra Equations ; 4. The numerical methods for Curve Fitting.
CS2208	3	Java GUI Programming	This course is aimed at introducing Java GUI Programming . The following topics will be covered in this course: Event Handing Graphical user interface components(GUI) Exception Handing Multithreading Multimedia: image, audio, and animation
CS2210	3	Linux/Unix Programming	This course starts from the basics, explaining how to compile and run the shell program, qt program for KDE, and Linux standards for portable applications. Topics to be covered are: 1. Introduction 2. Shell Programming 3. The Linux Environment 4. Development Tools 5. Debugging 6. Programming KDE Using Qt 7. Standards for Linux
CS3201	3	Network Programming	The goal of this course is to provide students with a basic knowledge of the network programming. The main topics include introduction, data structures for network programming, Socket programming, TCP/UDP socket programming, Thread and Multiplexing I/O programming.

			Students will realize the following backgrounds of this course after completing it: 1. The data structure of network programming; 2. The client server-based TCP and UDP scket programming; 3. The advanced Thread and Multiplexing IO programming; 4. Implement a client server application.
CS3202	3	Programming Language	This course gives an introduction to the concepts found in a variety of programming languages and to languages from a number of different paradigms. Topics to be covered are: Prolog, scoping, parameter passing, types, polymorphism, exception handling. On completion of the course, students should be able to perform the following tasks: 1. Define abstract data type for a language; 2. Produce and explain the program output; 3. Explain exception handling mechanisms; 4. Produce programs exhibiting parametric polymorphism; 5. Explain essential differences between the functional, object-oriented, and other programming language paradigms.
CS3403	3	Introduction to VLSI	Course objective is to provide students with a comprehensive understanding of IC characteristics, specifications, classifies, design metrologies and manufactures. The course outline is as follows: IC industrial, characteristics, specifications and classifies, common use ICs, IC design concepts, semiconductor fabrications, and assembly and test concepts.
CS3204	3	Internet Technologies	The goal of this course is to provide the students with a basic knowledge of Internet Technologies. The students will realize the following internet technologies after finishing this course: 1. communication protocols 2. switching equipments 3. IPv6 Next Generation Internet Protocol 4. routing protocol 5. traffic control 6. Internet Quality of Service (QoS).
CS3206	3	Information Security	The goal of this course is to provide the students with a basic knowledge of information security. The students will realize the following important topics after finishing this course: 1. Introduction to information security. 2. Number theory 3. Cryptography systems, 4. Public key systems, 5. Symmetric cryptography systems, 6. Digital

			signature, 7. Security standards.
CS3207	3	Network Management	This course is aimed at introducing the concepts of network management. The following topics will be covered in this class. 1. Data Communications and Network Management Overview 2. SNMP Network Management 3. RMON 4. Management Tools and, Systems and Application .
CS3208	3	Introduction to Image Processing	This course will introduce fundamental concepts of image processing. The students will realize image enhancement, image restoration, image compression, image segmentation, and their applications following the introduction to this course. Finally, the integration of image processing and various classifiers will be also covered in this course.
CS3209	3	Web Database Programming	The database system is playing an important role for information storage, management and usage. The first stage of this course will discuss the topic of ER model in regard to create the connection between databases and the properties.
CS3402	3	Signals & Systems	The goal of this course is to provide the students with a basic knowledge of system and signals. The main topics include the time domain and frequency domain of analog signal、discrete signal、analog system and discrete system. The students will realize the following basics after finishing this course: 1. the convolution theory, 2. the Fourier transform, 3. the sampling theory, 4. the application of digital filter theory.
CS3406	3	Computer-Aided Design	1. This course presents the CAD tool design of analog integrated circuits. The course begins with CMOS technology and principles, and introduces how to design/simulate IC circuit via Cadence tool. 2. Some CMOS blocks are introduced, including current mirrors, inverting amplifiers, differential pairs, cascode amplifiers, one-stage and two-stage OP amp, bandgap reference, oscillator, VCO, and PLL. 3.Contant: Introduction to Full-Custom Design, CMOS Fabrication & Layout, Cadence Environment, Composer Editor, Hspice Simulator, Pre-Layout Simulation, Virtuoso Editor, Design

			Rule Check, Post-Layout Simulation, Case Study.
CS3410	3	Embedded System Overview	The course aims at providing basic embedded software/hardware trainings for students. The topics covered in this course include embedded software development tool chain, system architecture, and embedded operating system.
CS5054	3	Compiler Design	The goal of this course is to provide the students with a basic knowledge of compiler. The students will realize the following important compiler topics after finishing this course:1. Concepts of Compiler Structure. 2. Lexical analysis and Parsing. 3. Syntax Directed Translation. 4. Intermediate Code Gereration. 5. Machine- code Generation. 6. Code Optimization. 7. Run- time Organization. 8. Implementation of a Simple compiler.
CS3210	3	Multimedia Technology and Application	The objective of this course is to introduce the production, transmission and compression of multimedia and its applications.
CS3211	3	Artifical Intelligent	The goal of this course is to learn following import concepts in artifical intelligence: 1. Searching Strategies 2. Planning Method 3. Knowledge Representation 4. Learning
CS3213	3	Combinatorial Math	The goal of this course mainly introduces the important topics of combination mathematics and the topics which are seldom mentioned in discrete mathematic, the contents of this course include: 1. Permutation and Combination 2. Generating Function 3. Recurrence Relation 4. Structure of Algebra 5. Boolean Algebra 6. Encoding and Decoding 7. Finite State Machine
CS3214	3	Component-Based Software Development Technology	1.Basic Object Oriented Programming 2.Design Pattern 3.Unit Testing of Object Code 4.Component Design and Implementation 5.Distributed Object Programming 6.Mobile Objects (agent, mobility features) 7.Servelets, Java Server Page(JSP), Enterprise JavaBean (EJB)
CS3215	3	Introduction to Electronic Commerce	The goal of this course is to provide the students with a basic knowledge of electronic commerce. The students will realize the following important topics after finishing this course: 1. e-commerce overview 2. network architecture 3. B2C/C2B/G2C/C2C model 4. B2B/G2B model 5. sales

			& marking 6. network security and payment system 7. e-commerce management and regulations 8. mobil commerce and collaborative commerce "
CS3405	3	Communication System	This capstone design course is intended to prepare students for entry level jobs in the communications industry or for advanced study.
CS3409	3	Special Project for IC Test	Special Project for IC Test How to plan a test project How to a prepare test fixture How to write the test program How to prepare the SOP How to prepare the customer’ s report Practical Operation
CS4402	3	Introduction to Digital Integrated Circuit Design	1.This course presents the design of digital integrated circuits via FPGA CAD tool and Vrilog code. 2. Content: Architecture/Behavior Concepts, Verilog HDL Programming, Behavior/RTL/Gate-level Design, FPGA Implementation and Tools, Floor plan, Placement & Route, MOS Inverters: Static/Dynamic Characteristics, Static Logic Circuits: Combinational, Static Logic Circuits: Sequential, Dynamical Logic Circuits, Semiconductor Memories, Chip Input and Output Circuits, Case Study.
CS4202	3	Handheld Device Programming	This course is intented to introduce the programming skill for handheld devices. Topics include window programming, networking programming, database programming, and web service programming. Good documentation and coding style will be emphasized throughout the course.
CS4203	3	Technology English Reading	This course is mainly to teach the article how students studied IEEE and ACM carefully. Students, after finishing the course, can understand the following knowledge and skill: (1)the basic structure of the scientific and technological research paper, including abstract、introduction、method、result and discussion；2. the capability to grasp author's information fast.
CS4204	3	Introduction to Digital Communications	The goal of this course is to provide the students with a basic knowledge of digital communications. The main topics include terminology of digital communications and the concept of digital communication basics. The students will realize the following digital communication basics after finishing this course: 1. the functions and operation of

			passband digital transmission, 2. the spread-spectrum modulation, 3. the multiuser radio communications, 4. the fundamental limits in information theory, and 5. error-control coding.
CS4205	3	Computer Graphics	This course will use OpenGL API to write 3D interactive computer graphics programs.
CS4210	3	Introduction to Software Engineering	This course covers the key aspects of software engineering and Development. Topics include: system engineering, software process, system modes and UML, object-oriented design, software requirement, and software testing. On completion of this course, students should be able to perform the following tasks: 1. understanding the principles of software engineering; 2. understanding different development stages/models; 3. understanding and experience in writing requirements and specifications; 4. understanding and experience in designing and rapid prototyping; 5. understanding large scale software maintenance; 6. understanding general CASE tools and experience with particular CASE tools.
CS4401	3	Introduction to Digital Signal Processing	To introduce Digital Signal Processing and its fundamentals so that students can design and implement synthesis, analysis, filtering and modulation of signals in DSP applications.
CS4403	3	Introduction to Analog IC Design	1. This course presents the analysis and design of various analog integrated circuits via CAD tool. 2. Content: Introduction to Analog Design, CMOS technology, basic MOS Device Physics and MOS modelling, CMOS device charateristics(resistor and capacitor), CMOS subcircuits(Passive and Active Current Mirrors), Single-Stage Differential Amp., Comparator design, OP Amp. design (frequency compensation), High-performance OP, DAC/ADC design, Switched-Capacitor Circuit design.
CS4405	3	Embedded System Programming	The aim of the course includes the following: 1. let students understand the programming in embedded linux. 2. By the practical training in course, let students hold the capacity of developing the program in embedded system. 3. By some practical examples, let students study the kill of designing program in embedded linux.

CS4406	3	Introduction to IC Testing	Course objective is to provide students with a comprehensive understanding of IC test technology. The course outline is as follows: Basic Test Concepts, Principles and characteristics of variable IC Tests.
CS4409	1	Internship	Students taking this course should remain the internship for at least 6 weeks during the summer vacation. After the semester starts, the students make a presentation to share the experience with others (including the instructor). The grading is made by both the instructor and the hiring companies.
CS4207	3	Introduction to Wireless Networks Introduction	The goal of this course is to provide students with a basic knowledge of the computer networking. The main topics include networking introduction, Physical Layer of Networks, Data-link Layer of Networks, Network Layer of Networks, and Application Layer of Networks. Students will realize the following backgrounds of this course after completing the course: 1. The function of each network layer; 2. The operation of inter-layer; 3. Understand the operation of protocols; 4. Understand the algorithms and concepts of layered protocols.
CS4208	3	Computer Animation	This course will introduce those techniques and algorithms are used int the field of computer animation, and will plug into 3D computer animation programs.
CS4209	3	Technology English Writing	The architecture of a technical report/paper, Grammar, Frequently made mistakes, Writting and review
CS4211	3	Object-Oriented Software Engineering	This course covers the special features of object-oriented software engineering and provides an easy and practical introduction to the important characteristics of object orientation. Students will understand the following basics after finishing this course: 1. what is object-oriented software engineering; 2. why object-oriented software engineering is important; 3. how to develop software and manage a software project by using the Unified Modeling Language; 4. how to apply the modern development methods to software development.
CS4212	3	Programming with Personal Software Process	This course covers the basics of personal software process (PSP). Topics include: the personal process strategy, the baseline personal process, the planning phases of PSP, and

			the measurement in the PSP. Students will realize the following basics after finishing this course: 1. the concept of PSP; 2. how to plan the process, resource, and schedule in the PSP; 3. how to measure software size in the PSP.
CS4213	3	Introduction to Soft Computing	The goal of this course is to provide the students with a basic knowledge of soft computing. The main topics include subspace method of pattern recognition, Bayes' theorem, statistical pattern recognition, perceptron and adaptive linear filters, multilayered perceptrons (MLPs) and back propagation (BP) learning, recurrent networks and optimization, and support vector machines (SVM). The students will realize the following concepts after finishing this course: 1. put on pattern recognition by supervised learning; 2. solve problems by using soft computing methods; 3. develop applications of pattern classification, information search and retrieval, data analysis and authentication.
CS4404	3	Embedded OS Implementation	To help students gain experience in porting operation system in embedded system.
CS4407	3	IC Test System	Course objective is to provide students with a comprehensive understanding of IC test equipments. The course outline is as follows: test system introduction, basic test circuits, tester architecture, commercial tester, handlers, probers, and test tools.
CS4408	3	IC Test Programming	Course objective is to guide the students how to develop a IC Test Program
IC4001	2	Employment and Learning in Information Industry	After many years studing in compter technology, the objective of the course is to help students to get a good job in information industry. It includes how to select a company, how to apply a new job, how to interview with employer and so on. In addition, it will promote the students ability of himself/herself leraning in information industry and how to cooperation with your co-workers for lifelong learning.