

Course Description

Algorithm Design and Analysis
A systematic study of important and useful computer algorithms for solving practical problems; sorting and searching, string processing, geometric and graph algorithms, combinatorial optimization techniques; average and worst-case analysis, time and space complexity, correctness, optimality, and real implementation.
Graph Theory
Linear Graph, Euler Graph Theory, Incidence, Cut-Set and Circuit Matrix related properties. Single Flow Graph, Logic Circuit Automata and their application.
Topics in Artificial Intelligence
Efficient and intelligent search techniques. Knowledge representation, e.g., logic, semantic net. Reasoning techniques including reasoning under uncertainty. Exposure to different artificial intelligence systems like planning, learning (including neural network). Programming experience in Prolog, Lisp, expert system shell.
Database Management System Design
This course will discuss data modelling, SQL, database application development, indexing, query optimization, transaction management and database design. Concepts of parallel databases, data warehousing and data mining will be covered.
Software Development Methodology
This course deals from traditional methodology such as waterfall to up to date like scum. It also includes practical tools for industry domains.
Topics in Computer Graphics
A course designed to concentrate on special and state-of-the-art topics in 2D, 3D mathematical methods including, Scale-Conversion, Painting, Shading, Rotation, Clipping Windowing Hidden Surface Algorithm
Topics in Compiler Construction
Principles and practice of the design and implementation of a compiler, focusing on the application of theory and trade-offs in design. Lexical and syntactic analysis. Semantic analysis, symbol tables, and type checking. Run-time organization. Code generation. Optimization and data-flow analysis
Virtual Reality
Theory and practice of virtual reality (VR). Provides in-depth overview of VR, including input devices, output devices, 3D navigation techniques, 3D selection and manipulation techniques, system control techniques, interaction fidelity, scenario fidelity, display fidelity, design guidelines, and evaluation methods.

Computer Network Performance Analysis

Development and application of mathematical models for queuing systems. Topics include Poisson and Erlang systems, bulk and priority queues, queuing networks, and the optimal design and control of queuing systems.

Communication Protocol Design and Analysis

An in-depth study of the state of the art of protocol engineering. Enables students to apply the techniques of protocol design to real problems in communication protocols

Evolutionary Systems

After introduction to the basic principles and techniques of a representative of the genetic algorithm for Evolutionary computation. Based on this genetic algorithm that can learn how to take advantage of this in the General search and optimization problems and machine learning, etc.

Also, learn how to solve the problem of local optima and compared to each other and review.

Topics in Wireless Mobile Networks

This course will study 3G / 4G, Wibro network structure in the latest systems, such as wireless mobile network, resource management, mobility management, QoS management, and the network convergence.

Topics in SIP Applications

This course deals with the operation principle of the SIP (Session Initiation Protocol), a message structure, the component presence event package, conference event package, the SIP event package and its various applications.

Ubiquitous/Sensor Networks

In this course, students will study about RFID system, the ubiquitous network, the sensor network, the home network, such as a Wireless Personal Area Network and the Ubiquitous / sensor network-related topics.

Topics in Internet Programming

With the advent of Web 2.0 and X-Internet, The methodologies that can provide the user with a convenient experience on the Internet, and effectively manage large amounts of data are required. This course will learn techniques such as X-Internet Programming AJAX, FLEX that Identify the challenges that

this implies and existing Internet applications. It provides convenient user experience to users and effectively manages large amounts of data.

High Performance Computer System

Deals with various ways to maximize the performance of the computer system. To increase the computing power, Deals with Parallel processing of combining multiple processors, High-performance storage device for increasing the performance of the storage device, and the concept of a high-performance operating system to minimize the load on the existing operating system.

Parallel Algorithms

Deals with the basic concept of distributed processing. From the same basic concepts of time and state management, Deals with Balancing algorithm, a middleware for distributed processing, the Distributed File System and the subject of the operating system that is responsible for memory management.

Topics in Spatial Database

Space data consisting of is the base data for ubiquitous and mobile environments and the geometrical data of the attribute and variable length. To treat effectively, Studies on modeling techniques and multi-dimensional spatial index technology.

Topics in Telematics and LBS

Based on the user's position in the mobile environment, LBS (Location-based Services) provide a variety of services. Students will study the underlying technology necessary for advanced telematics and LBS industry.

Topics in Multimedia Engineering

Study of the structure of the multimedia signal including JPEG, MPEG, P * 64, Wav, MP3 etc. After looking at for compression coding and decoding techniques and methodology of the multimedia signal, research for applications that can take advantage of these data. Researches based on the necessary technology for the telematics and LBS (Location-based Services)

Multimedia Information Retrieval

Understand the limitations of text-based information retrieval. To retrieve multimedia data efficiently, Students can express multimedia information. They will learn about the methodology of indexing and features information for searching. Also learn how to manage the semantic information of the multimedia.

Advanced Internet Systems

In the TCP / IP Internet environment, Students study for advanced Internet technologies and systems perform development tasks such as protocols, services, construction, real-time multimedia services development, web programming application development.

Topics in Operating Systems

Identify trends in operating areas and Explore the latest subject of detailed field studies including Real-time operating system, high-performance storage systems, embedded operating systems, mobile computing, and distributed operating system

Complexity and Computation Theory

With a Turing machine, Formalize the scope of the problem and possible solutions with the computer, Students learn the specific representation of the problem domain. With P, NP, through the concept of NP-completeness, Learn how to measure and determine the resolution of possible the scope of problem.

Distributed Systems

Based on a basic knowledge of the computer operating system and the network, study of the basic concepts for supporting applications that work in a distributed environment
Students learn the practical skills through practical design and implementation practice about Inter-process communication, naming, synchronization, security, concurrency.

Computer Vision

Introduces the theory of Low-level image analysis methods, stereo vision, motion, video image processing, and object recognition, and perform the actual application tasks.

Advanced Embedded Systems

The latest research on embedded technology and perform design tasks including system software and hardware design, development, verification,

Topics in Embedded Software Engineering

Due to mass production and a combination of hardware, embedded software is a critical system quality factors. Consider the characteristics of embedded system, Study a variety of research topics for analysis, design, development, and testing.

Technical Writing in Computer Science

Covers the actual writing practice of technical Writing and learning-related information including science Writing in engineering, engineering Screening terms of use, How to use this chart, plagiarism prevention, such as Science Writing in English.

Technical Projects in Computer Engineering 1

Research and develop topics in recent computer engineering. Students should present their concrete output in the public conferences.

Technical Projects in Computer Engineering 2

Research and develop topics in recent computer engineering. Students should present their concrete output in the public conferences.

Technical Projects in Computer Engineering 3

Research and develop topics in recent computer engineering. Students should present their concrete output in the public conferences.

Technical Projects in Computer Engineering 4

Research and develop topics in recent computer engineering. Students should present their concrete output in the public conferences.

Advanced Computer Architecture

In this course, after research operation of an electronic calculator, control, storage, and the various design examples of input and output devices, Studies Pipeline Processor, Multiple Processor, Special Purpose Computer etc.

Topics in Pattern Recognition

This course deals with the techniques of the various probabilistic method based on neural networks and pattern recognition, including the HMM.

Topics in Image Processing

This course deals with the continuous image characteristics, the digital image characteristics, the two-dimensional linear processing, image Restoration, image analysis, image coding, etc.

Advanced Operating Systems

This course deals with Multiprocessor, computer systems connected through a network, real-time systems, and functions of the operating system should be applied in specialized systems such as embedded systems, and Implementation methods.

Advanced Database System

The survey problems of a relational database system that is currently the most widely used, and the various systems proposed to solve this problem. Also, deal with a knowledge-based system that is an advanced database service.

Advanced Software Engineering

Advanced concepts of object-oriented and architectural design, along with implementation. Pattern-based design of software using the Unified Modeling Language. Design patterns as re-usable architecture.

Software Quality Engineering

Study the related methodology for software testing that is an essential step in the software development process. In addition to Statistical testing method, algebraic theory for testing, and learning graph theory, study also a method for applying a software engineering approach.

Topics in HCI

After dealing with Graphic structure of the X-Window system which can easily implement the user interface, and programming techniques, deals with the basic concept to build a user interface, such as caused by a voice synthesis and recognition.

Probability, Random Process, and Queuing Theory

After introducing the basic concepts and properties of the queuing model including Analysis of the observed results, the electrical signal, the probability that the random variable, the random process, the correlation function and the power distribution, deals with Probabilistic models, scheduling, stochastic processes, laws of conservation, and queuing networks.

Advanced Object-Oriented System

The concepts behind the patterns approach will be studied, followed by a detailed examination of a selection of the various patterns. Gamma et al. have categorized these patterns under Creational, Structural, and Behavioral. In this introductory course to design patterns, the following patterns will be studied and applied: Creational Patterns: Abstract Factory, Builder, Factory Method, and Singleton; Structural Patterns: Adapter, Composite, Decorator, and Proxy; Behavioral Patterns: Iterator, State, Strategy, and Template Method. Projects consist of software problems whose design and maintenance call for the application of these patterns.

Cluster/Grid Computing

Grid computing: its importance, architecture and issues; services and applications by type abstraction and virtualization; capacity planning; exploring platform as a service; security; mobile application development and case studies; graduate project encompassing advanced synthesis and application of grid computing principles.

Information and Network Security

This course is intended to give an in-depth understanding of computer system security. Security encompasses hacker challenges, malicious break-ins and insider threats. Topics include: Basic Encryption and Decryption - Rivest-Shamir-Adelman (RSA) Encryption, El Gamal and Digital Signature Algorithms, Hash Algorithms, Kerberos; Program Security - Virus, Trojan Horse, Malicious Code, Covert Channels; Design of Trusted OS; Network Security - Firewalls, Tripwires; Intrusion Detection - Audit Trail-Based Schemes, Concurrent Intrusion Detection

Mobile and Ubiquitous Computing

Covers the core technologies of various mobile and ubiquitous computing techniques that working in the mobile communication network, the Internet, a computer operates in such a fused ubiquitous environment. Understand the latest trends in distributed systems and explores selected major research topic including Ubiquitous computing, mobile computing, etc.

Topics in Next Generation Network

This course deals with the next generation network including Next Generation Internet, mobile communication, satellite communication, optical communication, etc.

Topics in BigData

Students study and practice basic theory for data analysis by learning R language as a basic tool for data analysis.

Topics in Smart App Development Methodology

This course introduces the concept of standard library to improve students' ability for App planning/design/development. In addition, this course deals with practical application development methodology to improve practical skills.

Topics in IT Consulting

In this course, students acquire the ability to plan competitive information strategy planning by studying the latest business information system technology and the methodology to build information strategy planning.

Topics in Software Engineering

This course helps students study the methodology and tools used in industrial field related to software engineering subjects to develop practical skills.

ICT Convergence Technology

This course introduces the elements of ICBM(IoT, Cloud, Bigdata, Mobile), related technologies, business models and market prospect. In addition, this course presents the vision of the future intelligence information society through case studies applying ICBM and discusses technical solutions for resolving real difficulties.

Topics in Internet Technology

This course introduces the latest Internet technologies related to the Internet field which is very fast changing. This course also discusses cloud-based client-server technologies which is one of the core technologies in the business field, and practices cloud and web-related main technologies to improve practical ability.

Master Paper Research Work

Development and writing of a research paper for submission to the department, which specifies its format.

Doctoral Paper Research Work(1)

Development and writing of a research paper for submission to the department, which specifies its format.

Doctoral Paper Research Work(2)

Development and writing of a research paper for submission to the department, which specifies its format.