

Course Description

Advisor Counsel			
Yr. :	Sem. :	Course Code:	FD0001
Students meet an advisor professor at least once a semester to be consulted on learning performance, study plan, campus life, employment, applying higher degree, friendship, and so on in order to get help for successful college life.			
Introduction to Engineering Design			
Yr. : 1	Sem. : 1	Course Code:	CD0003
This course introduces conceptual design methods for performing teamwork and customer-oriented design with project based approaches and applying project related tools with several practical examples. The students also learn about how to present a project result, activities as a team member, and ethics as an engineer.			
Introduction to Computer Engineering			
Yr. : 1	Sem. : 1	Course Code:	CD0058
This course is an introduction to the courses and curriculum as well, some research topics performed in the laboratory in our department. This course is run by all the faculty members of the department and provides students in an interesting manner with various practical applications and the variety of recent technology to apply computer engineering. This course helps the students establish their major related activities such as course planning and participation in some lab projects. Furthermore, it also helps the students do their career exploration and establish their study objective.			
Programming Basics			
Yr. : 1	Sem. : 1	Course Code:	CD0059
In this course, students learn the basic principles of how a computer operates such as data storage and program execution mechanisms, and learn the way to develop application programs using various programming elements like variable, operator, function, class, GUI library, and so on, based on Python programming language.			
Digital Engineering			
Yr. : 1	Sem. : 2	Course Code:	CD0005
This course covers the basic logic gates, combinational logic circuits, Boolean algebra, sequential circuits based on flip-flops, counter and registers.			
C Programming			
Yr. : 1	Sem. : 2	Course Code:	CD0060
This course provides fundamentals of C language for both high-level and low-level programming. Students study basic features of C language such as functions, arrays, structures and pointers as well as basic syntax for structural programming, and also study C programming techniques for development of application programs.			

C Programming Application			
Yr. : 1	Sem. : 2	Course Code:	CD0061
This course provides how to design and develop application programs using main features of C programming language such as functions, arrays, structures, and pointers mainly through programming practices.			
Digital Engineering Lab.			
Yr. : 2	Sem. : 1	Course Code:	CD0006
In this laboratory course, students experiment on digital logic designs with basic gates, arithmetic logic unit using half and full adder, flip-flops, counter, register.			
Java Programming			
Yr. : 2	Sem. : 1	Course Code:	CD0017
This course covers introduction to the Java language and high-level programming skills based on the object-oriented concepts. Topics include basic Java language components and libraries, object-oriented programming, GUI programming, thread, input/output, network and database programming.			
Data Structure			
Yr. : 2	Sem. : 1	Course Code:	CD0062
This course is the basic subject which provides students with an opportunity to further develop and refine their programming skills. In particular, the emphasis of this course is on the organization and implementation of information using common data structures such as list, stack, queue, tree, sort, and graph. This course also deals with time and space complexity for the analysis of algorithms.			
Data Structure Lab.			
Yr. : 2	Sem. : 1	Course Code:	CD0063
This course practices the methods for solving application problems which occur in real world using basic data structures studied in the course of Data Structure.			
C++ Programming			
Yr. : 2	Sem. : 1	Course Code:	CD0064
This course introduces the basic elements such as variable, function, reference and class in C++ programming language which is a object-oriented programming language, and improves students' programming ability using C++ by learning advanced topics like UML, STL, multithread, GUI library, and so on.			
Web Programming			
Yr. : 2	Sem. : 1	Course Code:	CD0010
This course helps students to understand basic operation of TCP/IP and HTTP which are fundamental communication protocols for web system. In this course, students also can learn simple packet analyzing			

method, XML and web programming language such as PHP, JavaScript.

Electronics System

Yr. : 2

Sem. : 1

Course Code:

CD0011

This class helps the students understand the fundamentals of electrical and electronic engineering systems; the characteristics and principle of components, circuit analysis theories, the structure of semi-conductors, etc. Thereafter, the concepts, which are the development processes into digital systems and the driving actions of the innermost of computer hardware can be established. It will be very helpful for the students in studying computer engineering discipline.

Computer Architecture

Yr. : 2

Sem. : 2

Course Code:

CD0013

This course covers computer hardware design and system organization. Students will learn characteristics and functions of computer hardware systems such as information representation, CPU structure and its functions, memory hierarchy, I/O devices, I/O system interface, and control unit design.

Software Analysis and Design

Yr. : 2

Sem. : 2

Course Code:

CD0065

This course introduces UP(the standard development methodology), UML and design patterns in order to let students cultivate practical software development skill. The students are required to have basic object-oriented programming techniques and knowledge about data structures. Trying to solve given problems which are common in real environment or classical algorithmic topics, the students will experience the full process of software project, requirement analysis, design, implementation, testing, and evaluation.

Linux System and Programming

Yr. : 2

Sem. : 2

Course Code:

CD0014

A practical introduction to Unix/Linux operating system. Topics include operating system installation, major Linux utilities, Unix/Linux file structure, interaction with shell, graphical user interfaces and commands. Basic administration techniques and system programming with system calls and libraries are also included.

Multimedia Engineering

Yr. : 2

Sem. : 2

Course Code:

CD0016

This course helps students to understand the multimedia elements; text, sound, image, video and animation. Students can use multimedia authoring tools to create their multimedia contents.

GUI Programming

Yr. : 2

Sem. : 2

Course Code:

CD0066

This course enables students to learn the GUI programming concept and to be good at GUI programming with at least one programming language. In terms of learning the basic concepts, the students learn the basic concepts with C language and the MFC framework developed in C++ language, one of the object-oriented programming languages in the Windows environment. In practical terms, the students practice lots of GUI

programming techniques with C# or Qt that support easier development and cross-platform.			
Introduction to Internet of Things			
Yr. : 2	Sem. : 2	Course Code:	CD0067
This course provides the concept and usage of control boards, sensors, and actuators for understanding IoT systems. Students study the networking and programming techniques for constructing IoT systems, and finally design techniques of IoT systems.			
Operating System			
Yr. : 3	Sem. : 1	Course Code:	CD0018
This course examines principles and structures of operating systems. The operating system covers process management, communications between processes, main memory allocation, structure of file systems, I/O systems, and introduction to distributed systems.			
Computer Network			
Yr. : 3	Sem. : 1	Course Code:	CD0019
The course provides general information on the concept of computer networks including basics of networks and protocols, design approaches of network application programs, control mechanisms of the transport layer and the data link layer, and internetworking and routing techniques.			
Database			
Yr. : 3	Sem. : 1	Course Code:	CD0020
This course covers database theory and the use of databases in applications using relational DBMS. It includes relational data model, relational algebra, relational calculus, SQL, and normalization process for database design. There is a term project that explores database application in web environment.			
Microprocessor			
Yr. : 3	Sem. : 1	Course Code:	CD0021
In this course, students can learn internal architecture and interrupt of microprocessor, external signals of microprocessor and connecting circuit using them. This course also includes control methods of internal modules and interrupt procedures for major commercial microprocessors such as 80x86 and AVR. Therefore this course helps students to develop system level program which can access and control hardware directly.			
Programming Language Concepts			
Yr. : 3	Sem. : 1	Course Code:	CD0023
This course focus on major concepts found in current programming languages. By learning the fundamental elements of programming languages and enhancing the ability to evaluate aspects of programming languages, students can understand the principles of programming language design.			
Software Engineering			

Yr. : 3	Sem. : 1	Course Code:	CD0024
In this course, the basic concepts and principles of software engineering and the whole process of the software development including requirement analysis, design, implementation, test, and maintenance of software systems are introduced. The students will learn practical software development skills through a series of projects that cover from system analysis to design.			
Image Processing			
Yr. : 3	Sem. : 1	Course Code:	CD0068
This course covers the fundamentals of image processing and pattern recognition including image enhancement, feature extraction and classification. Students can design their pattern recognition system using images.			
Embedded System Lab.			
Yr. : 3	Sem. : 2	Course Code:	CD0025
In this course, students make experiments on embedded linux CDE and various device drivers which access linux kernel source, so students can learn linux system level programming ability and knowledge for developing embedded system.			
Planning Capstone Project			
Yr. : 3	Sem. : 2	Course Code:	CD0069
Students can plan and schedule their capstone projects by analyzing latest technology trends and examine market conditions. This course helps students to successfully process their future capstone project on time.			
Open Source Project			
Yr. : 3	Sem. : 2	Course Code:	CD0070
In this course, students design convergence products using open sources in the areas of operating systems, computer networks, databases, computer graphics, image/video processing and etc. They implement products using up-to-date software packages and hardware tools and evaluate performance of the products.			
Computer System Security			
Yr. : 3	Sem. : 2	Course Code:	CD0027
This course introduces the fundamental interests of the computer security principles, and provides entry-level knowledge on security with multiple problems and solutions involved. The topics include the definition of security, authentication, access control, hash function, digital signature and encryption techniques. This course also deals with the system security related attacks and defenses including password cracking, biometrics, race condition, backdoor, intrusion detection and the latest security technology.			
Smart App Programming			
Yr. : 3	Sem. : 2	Course Code:	CD0028
This course provides an introduction to developing applications for mobile platforms. It includes the use of integrated development environment and programming techniques for layout, event, graphics, multimedia,			

connecting to server, etc. There is a term project that develops mobile application program with connection to a server in web environment.

Embedded System

Yr. : 3

Sem. : 2

Course Code:

CD0030

In this course, students can learn ARM based embedded Linux CDE, Linux kernel module and various device drivers which directly access Linux kernel source. Then this course includes kernel configuration method, kernel source patch method and method for implementing root file system optimized for embedded system. So students can learn Linux system level programming ability and knowledge for developing embedded system.

Computer Graphics

Yr. : 3

Sem. : 2

Course Code:

CD0032

This course will give you the opportunity to understand the principles and practices of computer graphics and interactive graphical methods; 2D and 3D graphics fundamentals, representation of graphical objects, and geometric transformation. In addition, you can deal with 3D projection, viewing transformation, hidden surface elimination, rendering using OpenGL which is based on virtual reality environment. Also, several spline curves and fractal methods will be studied for high-level graphic techniques.

Next-Generation Network Technology

Yr. : 3

Sem. : 2

Course Code:

CD0071

In this course, students study next-generation network technologies, protocol design techniques, and network programming techniques on the basis of understandings on computer networks. They learn up-to-date application techniques of computer networks such as network management, network forensics, network hacking and security.

Capstone Design Project1

Yr. : 4

Sem. : 1

Course Code:

CD0033

Using the knowledge and ability acquired during the coursework, students carry out a whole process of team project on recent professional computer engineering issues. Students figure out a topic for a project of their own, solve the problems under the given constraints, collaborate with one another, and practice effective oral presentation and documentation.

Compiler Construction

Yr. : 4

Sem. : 1

Course Code:

CD0036

Theoretical and practical aspects of compiler design, including lexical analysis, parsing context free language, and machine-independent code generation. Acquired techniques can be applied to any kinds of document or text processing in various areas of information technology including embedded system, web services, computer games and so on.

Computer Vision

Yr. : 4

Sem. : 1

Course Code:

CD0072

The goal of computer vision is to enable computers see the world. Computer vision extracts useful visual information from images and videos captured by a camera and use such information to understand the object in a scene. This course introduces the fundamental machine learning and covers various topics of pattern recognition such as feature extraction, object detection, object recognition, object tracking, and their applications. The students learn OpenCV and Vision API and finally develop interesting computer vision applications.

Algorithm and Problem Solving

Yr. : 4

Sem. : 1

Course Code:

CD0073

This course helps students to be able to recognize real-world problems as algorithmic form and to solve the problems. Students can categorize data structure of problems as stack, queue, string, tree, or graph, and apply suitable algorithms. The algorithms are analyzed through time complexity and space complexity.

Current Technology in Web and Mobile Computing

Yr. : 4

Sem. : 1

Course Code:

CD0074

This course aims for students to develop web applications in the mobile environment by covering both server-side and client-side APIs. For server-side, it includes the web service fundamentals and a variety of Open APIs such as cloud services. For client-side, it includes Open APIs that interact with devices hardware, sensors, services and applications such as the camera, microphone, sensors, native address books, calendars and native messaging applications. Each student as a member of a team participates in a term project of a useful mobile service with above web-based application technologies.

Kernel and System Programming

Yr. : 4

Sem. : 2

Course Code:

CD0031

Explores the internal structure of Linux kernel. Topics include booting process, process management, memory management, file systems, system call and modules. Digs into the kernel source code and trace essential functions. We implement device drivers that uses kernel data structure and kernel functions in order to understand their meaning and operations.

Capstone Design Project2

Yr. : 4

Sem. : 2

Course Code:

CD0039

Using the knowledge and ability acquired during the coursework, students carry out a whole process of team project on recent professional computer engineering issues. Students figure out a topic for a project of their own, solve the problems under the given constraints, collaborate with one another, and practice effective oral presentation and documentation.

Artificial Intelligence

Yr. : 4

Sem. : 2

Course Code:

CD0075

This course helps students understand the basic concept of artificial intelligence and teaches the implementation principles about representative artificial intelligence techniques such as search, inference, machine learning. This course also improves students' ability to develop intelligent systems through some real-world case studies adopting artificial intelligent techniques.

Current Technology in Computer Systems

Yr. : 4

Sem. : 2

Course Code:

CD0076

This course introduce important concepts of parallel computing systems and distributed computing systems. Fundamental theories and ideas for hardware/software in high performance computing systems are introduced to students.

Advanced Internet Application

Yr. : 4

Sem. : 2

Course Code:

CD0077

Students can learn several communication protocols for real-time multimedia data transmission through Internet such as RTP and RTCP. And based on these knowledge students can carry out group projects about real-time Internet application.

Edge Computing Project

Yr. : 4

Sem. : 1

Course Code:

CD0080

This course aims for students to develop location-based mobile applications in the edge computing environment. Each student as a member of a team participates in a term project of a useful mobile service. The goal is to write a paper explaining the contents and results of the term project and present it at an academic conference.