

Beijing University of Posts and Telecommunications

**School of Information and Communication
Engineering**

**Undergraduate Course Descriptions
(2017)**



School of Information and Communication Engineering

Academic Affairs Office of BUPT

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3112101750<Project Management and Economic Decision-Making> Course Description

Course: Project Management and Economic Decision-Making

Course No.: 3112101750

Credit / Course Hours: 1/16

Preparatory Course: None

Course Description: This course supports the eleventh items of graduation requirements in the training program of electronic information (information and communication) through the general principles and related methods of project management and economic decision-making. As an important part of thinking training in innovative entrepreneurship education system, this course emphasizes the basic principle of learning engineering project management and economic decision-making, mastering the basic methods of project planning and process control, time and cost management, economic forecasting and decision-making, etc, and identifying the key elements of information project management and economic decision-making, so that management principles, technical and economic methods can be applied to multi-disciplinary electronic information system development, design, construction, operation and maintenance process.

3112102230<Personal Development Planning and Innovation and Entrepreneurship> Course Description

Course: Personal Development Planning and Innovation and Entrepreneurship

Course No.: 3112102230

Credit / Course Hours: 1/16

Preparatory Course: None

Course Description:

This course combines online learning with classroom practice to cultivate students' self-learning skills, communication skills and career development plans, and guide students to work in a team spirit and create a sense of innovation and entrepreneurship. The main contents of the course are as follows: the basic skills of career communication and teamwork, including the presentation of technical reports and the design of speech lectures, technical preaching and presentation of speeches, professional accomplishments and career choices; innovative entrepreneurship thinking and ability training, including innovative case studies,

3112102240<Design Thinking and Innovation Method> Course Description

Course: Design Thinking and Innovation Method

Course No.: 3112102240

Credit / Course Hours: 1/16

Preparatory Course: None

Course Description:

This course is the first part of series courses for engineering professionalism. It is a course that fosters students' design-thinking and innovative ability, which introduces "user-centered" design-thinking and major innovation methods in TRIZ theory. This course mainly includes the key steps of design thinking and the corresponding tools, creative thinking techniques, methods of resolving contradictions, systemic analysis method, and technological evolution. Through theoretical study and project practice, the students will be able to construct a cognitive thinking system that creatively solves complex and unknown problems, to use design thinking for innovative design, and to apply several TRIZ tools to solve the design problems for product prototype. It lays the foundation of thinking for the follow-up participation in the practice of innovation in the professional field.

3112101760<Computing for Engineers> Course Description

Course: Computing for Engineers

Course No.: 3112101760

Credit / Course Hours: 2/32

Preparatory Course: Linear Algebra, Mathematic Analysis or Advanced Mathematics

Course Description:

This course is a course of mathematics and natural sciences, open for the second grade students who major in communication engineering, information engineering and electronic information engineering at Beijing University of Posts and Telecommunications. The course can support the requirements of 1.2&5.3 on the table of capability of undergraduate students.

The core objective of this course is to cultivate students' capability of understanding, analysis, modeling, programing for calculation and visualization analysis for a complex engineering problem, so as to support

the students to learn the following courses and solve practical engineering problems. Contents such as error theory, solving linear/unlinear equations, optimization of problem with constraints, interpolation, function approximation and data fitting, statistical analysis of the data set, data visualization and analysis would be learned in this course, and the powerful computing tool MATLAB will be used to solve these problems. With the learning and training of this course, students will be able to realize analysis, modeling, and select the most appropriate tools to solve problems for engineering problems with different complexity.

3112101800<C/C++ Programming> Course Description

Course: C/C++ Programming

Course No.: 3112101800

Credit / Course Hours: 3/48

Preparatory Course: None

Course Description: C/C++ is one of the most powerful programming languages available which is widely used in practical programming tasks including industrial software products. This course aims to give students an introduction to the C/C++ language and programming methods, from basic constructs to program structure to advanced programming concepts. It covers the fundamentals of C/C++, such as data types, control structures, arrays, fuctions, pointers, classes and concepts of object-oriented programming.

3112101820<Data Structures and Algorithms> Course Description

Course: Data Structures and Algorithms

Course No.: 3112101820

Credit / Course Hours: 3/48

Preparatory Course: C/C++ Programming

Course Description: This course mainly focuses on the basic knowledge of general programming, algorithm design and analysis, including data logical structures, storage structures and related algorithms in the field of non-numerical computation. The content of the course covers not only list, stack, queue, string, multi-dimensional array, tree and graph, but also general search and sorting algorithms. It aims to train the students to apply above knowledge to solve the problems of information storing, organizing and processing in engineering applications.

3112101830<Computer Principle and Application> Course Description

Course: Computer Principle and Application

Course No.: 3112101830

Credit / Course Hours: 3/48

Preparatory Course: Digital System Design

Course Description: Computer Principle and Application is a fundamental computer hardware course for communication, information, electronic and other correlated majors. This course supports the first and fifth items of graduation requirements in the electronic information training plan (information and communication) of Beijing University of Posts and Telecommunications.

This course emphasizes on the structures, operating principles and applications of microcomputers. The content of this course covers operating principles of microprocessors, memory and storage management, bus and input/output interface technology, process and thread of operating system, comprehensive application and design of microprocessors. The significant parts of this course include the fundamentals and operating principles of microcomputers, the engineering applications, thinking and methods of practical system design. This course helps the students establish the holism of microcomputer system, understand the dialectic relationship between hardware and software, cultivate their computer application thinking ability, strengthen their fundamentals and principles for system design, grasp the classical cases of application system design, realize the system analysis, design and development, and lay the theoretical and engineering research foundation for future work in the fields of information, communication and broadcast.

3112100130<Digital Signal Processing> Course Description

Course: Digital Signal Processing

Course No.: 3112100130

Credit / Course Hours: 3/48

Preparatory Course: Probability Theory and Mathematical Statistics, Signals and Systems

Course Description: This course mainly focuses on the general concepts, principles of digital signal processing. Its goals are to develop skills for analyzing and synthesizing algorithms and systems that process discrete time signals, with emphasis on realization and implementation. The content of the course

covers the analysis of discrete-time signals and systems, sampling and quantization of analog signals, the common characteristics of discrete system (linear, time-invariant, stability, causality and discrete convolution) , the z-transform, the discrete-time Fourier transform, the discrete Fourier transform, the fast Fourier transform (decimation in time or decimation in frequency), the calculation of finite sequence linear convolution and partition convolution by using DFT and Fast Fourier Transform, and the design of digital filter including Infinite Impulse Response (IIR) and Finite Impulse Response (FIR) digital filters with their structures correspondingly.

3112100140<Principles of Communications I> Course Description

Course: Principles of Communications I

Course No.: 3112100140

Credit / Course Hours: 4/64

Preparatory Course: Probability Theory and Mathematical Statistics, Signals and Systems

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the physical layer of a point-point communication system. The content of the course covers analyzing of signal and noise, analog modulations including DSB-SC, AM, SSB, PM/FM, digital baseband transmission including PAM signals, power spectral density, inter-symbol interference, Nyquist criterion for ISI-free transmission and etc., signal space and optimum receiver, typical digital modulations including OOK, 2FSK, BPSK/DPSK, QPSK/OQPSK and M-ary modulations, sampling and quantization of analog signals.

3112101810<Introduction of Information and Communication Engineering> Course Description

Course: Introduction of Information and Communication Engineering

Course No.: 3112101810

Credit / Course Hours: 3/48

Preparatory Course: None

Course Description: This course focuses on the general concepts, methodologies, principles and tools of establishing complex end-end information and communication systems, to help recognizing the concepts,

processes and skills of engineering problems. The content of the course covers the fundamental of programming, fundamental of computers, fundamental of electronic circuits, fundamental of networks and end-end complex engineering, along with corresponding experiments and projects.

3112101840<Electronic and Circuit Foundation> Course Description

Course: Electronic and Circuit Foundation

Course No.: 3112101840

Credit / Course Hours: 5.5/88

Preparatory Course: Mathematical Analysis (I), Linear Algebra, Introduction of Information and Communication Engineering

Course Description:

This course mainly introduces basic concepts, basic theories and analysis methods of circuits, as well as working principle, characteristics and parameters, engineering analysis and design methods of semiconductor devices and common circuits they form. The main contents include various analysis methods of linear circuits, analysis of commonly used unit circuits composed of semiconductor devices, and corresponding in-class experiments. The course focuses on introducing basic concepts, basic theories, basic analysis methods and training engineering thinking mode. Through the course, students can cultivate their ability of analyzing and solving problems, engineering calculation, scientific thinking, experimental research and scientific induction, and establish the engineering concept of combining theory with practice. Students can also familiarize themselves with the usage of circuit simulation software and improve operating ability. The course lays the necessary foundation for students to realize the electronic system and follow-up course in the future.

3112101860<Digital System Design>Course Description

Course: Digital System Design

CourseNo.: 3112101860

Credit / Course Hours: 3.5/56

Preparatory Course: Electronic and Circuit Foundation

Course Description:

This course provides the basic principles, related analyses and designs methods of the digital system,

which supports the first and third graduation requirements in Electronic Information (Information Communication) training program.

As a basic course of Electronic Information (Information Communication) discipline, it focuses on learning the general principles of the digital system, including logical algebra foundation, combinational logic circuit and sequential logic circuit, programmable logic device, hardware description language and so on. This course lays solid theoretical foundation for students to learn digital system, and thus, students will have a deeper understanding of the digital logic circuit and digital logic system. They analyze logic circuits independently, design logic circuits with small scale of devices and programmable logic devices and to solve practical problems with digital technology. This course can establish foundation for further study of other professional courses that related to information communication, and furthermore, engineering work in the field of information communication.

This course also includes a series of in-class experiments. Students can be familiar with the design methods of logic circuits and enhance their practical ability. Via the combination of theoretical designs, simulation analyses and experimental verification, students can strengthen the understanding of knowledge they have learnt.

3112100132<Digital Signal Processing> Course Description

Course: Digital Signal Processing

Course No.: 3112100132

Credit / Course Hours: 3/48

Preparatory Course: Probability Theory and Mathematical Statistics, Signals and Systems

Course Description: This course mainly focuses on the general concepts, principles of digital signal processing. Its goals are to develop skills for analyzing and synthesizing algorithms and systems that process discrete time signals, with emphasis on realization and implementation. The content of the course covers the analysis of discrete-time signals and systems, sampling and quantization of analog signals, the common characteristics of discrete system (linear, time-invariant, stability, causality and discrete convolution), the z-transform, the discrete-time Fourier transform, the discrete Fourier transform, the fast Fourier transform (decimation in time), and the design of digital filter including Infinite Impulse Response (IIR) and Finite Impulse Response (FIR) digital filters.

3112100142<Principles of Communications I> Course Description

Course: Principles of Communications I

Course No.: 3112100142

Credit / Course Hours: 3/48

Preparatory Course: Probability Theory and Mathematical Statistics, Signals and Systems

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the physical layer of a point-point communication system. The content of the course covers analyzing of signal and noise, analog modulations including DSB-SC, AM, SSB, PM/FM, digital baseband transmission including PAM signals, power spectral density, inter-symbol interference, Nyquist criterion for ISI-free transmission and etc., signal space and optimum receiver, typical digital modulations including OOK, 2FSK, BPSK/DPSK, QPSK/OQPSK and M-ary modulations, sampling and quantization of analog signals.

3112190019<Electronic and Circuit Foundation> Course Description

Course: Electronic and Circuit Foundation

Course No.: 3112190019

Credit / Course Hours: 3/48

Preparatory Course: Advanced Mathematics, Introduction to Electronic System

Course Description: Electronic and Circuit Foundation is one of the fundamental courses for the majors in information, telecommunication and electronic engineering. It supports the graduation requirements of Telecommunications Engineering with Management major on item 1, 2, 4, and 5. Through this course, students systematically study basic elements, principles, concepts and equivalent circuit analysis methods of electronic circuits, including features of PN junctions, diodes, Bipolar Junction Transistors (BJT) and Field Effect Transistors (FET) as well as their basic amplifier circuits, feed-back amplifiers, power amplifiers, integrated operation amplifiers and their application circuits. This course focuses on basic elements and theory of electronic and circuits, as well as key problems analysis and solutions. The course aims to help students to develop their abilities of engineering mode of thinking, experiment studying and scientific induction, which contributes to building their engineering view of integrating theory with practice. Through this course, students are able to know basic elements and principles of typical amplifier circuits, to

make analysis by equivalent circuits and engineering approximation. Accordingly the necessary groundwork is laid for the further engineering implementation of the electronic systems and the follow-up study. The course includes theory study and experiments.

3112190100<Introduction to Electronic System> Course Description

Course: Introduction to Electronic System

Course No.: 3112190100

Credit / Course Hours: 3/48

Preparatory Course: Advanced Mathematics, University Physics, Linear Algebra

Course Description: This course introduces the basic conceptions and analysis methods of electronic devices, components, circuits and simple electronic systems, and mainly focuses on the general concepts, principles, knowledge and analysis of direct current and alternative current circuits. The content of the course covers the simple resistive circuits analysis, techniques of circuit analysis, the operational amplifier, the natural and step response of RL and RC circuits, the natural and step response of RLC circuits, sinusoidal steady-state analysis, and frequency selective circuits, aiming to provide a sound theoretical background to both analogue and digital circuits courses in subsequent semesters.

3112190110<Digital Signal Processing> Course Description

Course: Digital Signal Processing

Course No.: 3112190110

Credit / Course Hours: 3/48

Preparatory Course: Signals and Systems

Course Description:

This course aims to provide students with the concept of digital signal and its processing method. It includes the basic characteristics of discrete-time signal and system and the transform of discrete signal, such as the concept and characteristics of digital signal, the common characteristics of discrete system (linear, time-invariant, stability, causality and discrete convolution). Also the Fourier Transform and Z Transform of discrete-time signal and the difference equation of discrete system will be introduced. Besides, the method and corresponding calculation of Discrete Fourier Transform, such as Discrete-time Fourier Transform, the calculation of finite sequence linear convolution and partition convolution by using DFT and Fast Fourier Transform (decimation in time or decimation in frequency) will be described in the course.

In addition, the design of digital filter, such as Infinite Impulse Response (IIR) digital filter with its structure and Finite Impulse Response (FIR) digital filter with its structure will be covered.

3112100121<Communication Electronic Circuit> Course Description

Course: Communication Electronic Circuit

Course No.: 3112100121

Credit / Course Hours: 2/32

Preparatory Course: Electronic and Circuit Foundation, Signals and Systems

Course Description:

This course mainly introduces the structure and function circuits of transceivers used in radio technology equipment and systems, and the application of integrated circuits in various functional circuits. It mainly covers the content of noise and interference, high frequency amplifier, sine wave oscillation circuit, modulation-demodulation and frequency conversion circuit, feedback control circuit, RF transceiver design and etc. It also introduces the corresponding typical chip. The course focuses on introducing basic concepts, basic theories, basic analysis methods and training engineering thinking mode. Through the course, students can systematically master the working principle and analysis methods of the main functional circuits in communication system, the structure and design flow of the wireless transceiver front-end, and lay a foundation for the design of communication electronic circuits and follow-up courses. The course plays the role of bridge between basic courses and specialized courses. It emphasizes that theory should relate to practice and pay attention to the concept of engineering. It cultivates students' scientific thinking, experimental analysis ability and research innovation ability.

3112100170<Principles of Communications II> Course Description

Course: Principles of Communications II

Course No.: 3112100170

Credit / Course Hours: 2/32

Preparatory Course: Principles of Communications I

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the physical layer of a point-point communication system. The content of the course covers analyzing of signal and noise, analog modulations including DSB-SC, AM, SSB, PM/FM, digital baseband

transmission including PAM signals, power spectral density, inter-symbol interference, Nyquist criterion for ISI-free transmission and etc., signal space and optimum receiver, typical digital modulations including OOK, 2FSK, BPSK/DPSK, QPSK/OQPSK and M-ary modulations, sampling and quantization of analog signals.

3112100190<Fundamentals of Information Theory> Course Description

Course: Fundamentals of Information Theory

Course No.: 3112100190

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Mathematical Statistics

Course Description:

Information theory employs Probability Theory and Stochastic Processes to achieve fundamental limits on data compression and transmission. This course establishes the conceptual framework of entropy, mutual information, channel capacity, information rate. By introducing three coding theorems of Shannon, it systematically explains how the performance of source or channel is measured by these concepts, and how coding is applied to source or channel for efficient compression or reliable transmission respectively. Its objective is to enhance the ability of students in applying fundamentals of information theory to solve the practical problems in the domains of communication and information processing.

3112100480<The Principles of Digital Audio and Video> Course Description

Course: The Principles of Digital Audio and Video

Course No.: 3112100480

Credit / Course Hours: 3/48

Preparatory Course: Signals and Systems, Probability Theory and Mathematical Statistics, Fundamentals of Information Theory, Digital Signal Processing, Principles of Communications I

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the digital audio/video system and signal. Major topics include visual and auditory characteristics, acquisition and digitization of video and audio signals, digital processing, principles of compression, multiplexing and synchronization techniques of audio and video signals.

3112101700<Data Analysis Tools> Course Description

Course: Data Analysis Tools

Course No.: 3112101700

Credit / Course Hours: 2/32

Preparatory Course: Advanced Mathematics, Probability Theory and Mathematical Statistics

Course Description: Data analysis tools is one of the core professional basic courses of electronic information engineering (big data and information processing). With the development of the information technology and the Internet, the massive data presents the problem of information explosion. At the same time, it puts forward the urgent request to the data analysis and processing technology. Based on the traditional data analysis tools, a series of big data analysis software and tools has been widely used as the effective tools to solve the problem of efficient data analysis, such as statistical data analysis tools (Excel, SPSS), big data analysis platform (Hadoop, etc.), Python and its extension toolkit, etc. This course uses the data mining algorithm as the foundation, through the studying of this course, students will learn and grasp the common data analysis tools, training students to analyze and deal with different types of data. Through the practice and designed experiments, students' innovative spirit and practical ability are improved, so as to lay the foundation for further study of various data mining algorithms.

3112101770<Basic Theories of Networks> Course Description

Course: Basic Theories of Networks

Course No.: 3112101770

Credit / Course Hours: 2/32

Preparatory Course: Mathematic Analysis, Probability Theory and Mathematical Statistics

Course Description: This course treats some of the theoretical problems involved in networks, such as the computation and analysis models of Poisson process, M/M and M/G queuing systems, and the network flows. After having a good knowledge of the basic mathematical models, students will learn the concepts of networks, study the algorithms to analyze the performance of networks, and master the analysis tools for the topology and reliability of networks, which will improve the students' capability of theoretical modeling and networks evaluation.

3112101880<Modern Communication Technology> Course Description

Course: Modern Communication Technology

Course No.: 3112101880

Credit / Course Hours: 4/64

Preparatory Course: Principles of Communications I, Electromagnetic Fields and Waves

Course Description:

Based on the hierarchical architecture (End To End) of information and communication network and network integration, this course introduces many respects of the modern communication, such as the basic concepts, fundamental theory and implementation methods, while emphasizing the integration of fundamentality, forefront, technicality and exploration. This course mainly focuses on service and terminals, switch and routing, access and transportation, which plays an important role in the knowledge structure. Through this course, students could learn the architecture, technologies, development law and application foreground of modern communication system and network from whole network level. Furthermore, this course also lays a solid professional foundation for the students, inspires their enthusiasm and interests in professional learning and improves their professional sensitivity and adaptability.

3112101900<The Principles of Digital Audio and Video> Course Description

Course: The Principles of Digital Audio and Video

Course No.: 3112101900

Credit / Course Hours: 3/48

Preparatory Course: Signals and Systems, Probability Theory and Mathematical Statistics, Fundamentals of Information Theory, Digital Signal Processing, Principles of Communications I

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the digital audio/video system and signal. Major topics include visual and auditory characteristics, acquisition and digitization of video and audio signals, digital processing, principles of compression, multiplexing and synchronization techniques of audio and video signals.

3112101910<Digital Image Processing>Course Description

Course : Digital Image Processing

Course Number : 3112101910

Credit(s)/Course Hours : 2/32

Preparatory Courses : Signals and Systems, Digital Signal Processing

Course Description : The course consists of theoretical basis and algorithms of digital image processing, which helps the students prepare for their future research & developing work related to digital image processing. Major topics include image acquisition and representation, image enhancement, basic principles and methods of image restoration and basic principles and methods of image compression. This course focuses on introducing the basic theory and engineering knowledge of digital image processing, and the key problems in communication and the ideas and methods to solve these problems. This course aims to teach students the basic concepts and fundamentals of digital image processing and developing students' ability to solve complex engineering problems using digital image processing algorithms.

3112101920<Fundamentals of Information Theory> Course Description

Course: Fundamentals of Information Theory

Course No.: 3112101920

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Mathematical Statistics

Course Description:

Fundamentals of Information Theory is a basic course for the major of electronic information engineering, which supports 1.5 and 2.3 of the graduation requirements in the training program of electronic information engineering. This course uses mathematical statistics to study the problems of information processing and information transmission. By learning the basic knowledge of information measurement, modeling and coding of source and channel, and Shannon's three coding theorem, we train students to analyze and solve complex engineering problems in the field of information communication and radio and television by using the basic principles of information theory.

3112101930<Simulation and Modeling of Multimedia Systems> Course

Description

Course: Simulation and Modeling of Multimedia Systems

Course No.: 3112101930

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Principles of Communications I, Digital Signal Processing, The Principles of Digital Audio and Video

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the multimedia communication systems. The content of the course covers analyzing of multimedia data compression, multimedia synchronization methods, multimedia networks, multimedia terminals and systems including network-layer QoS technology and real-time transportation protocols, modeling and tools for multimedia network simulation based on discrete event system simulation methods and Monte Carlo methods.

3112101940<Introduction to Artificial Intelligence> Course Description

Course: Introduction to Artificial Intelligence

Course No.: 3112101940

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Mathematical Statistics, Linear Algebra

Course Description: Artificial Intelligence is the science of getting computers to act with the ability of understanding and analyzing. This course provides a broad introduction to machine learning, data mining, and pattern recognition. Topics include: Features and non-linearity, linear classification, supervised learning (support vector machines, K-nearest neighbors), unsupervised learning (K-means, spectral clustering), stochastic gradient descent, sampling method (Gibbs sampling), feed-forward and backward, and CNNs. This course will help you apply learning algorithms to build smart system for computer vision, audio, data mining, natural language processing and other areas.

3112101960<Information Theory> Course Description

Course: Information Theory

Course No.: 3112101960

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Mathematical Statistics

Course Description:

Information theory is a branch of applied mathematics used in electrical and communications engineering to study the quantification of information. It employs Probability Theory and Stochastic Processes to find fundamental limits on reliably storing and transferring data. The course of Information theory is one of the fundamental courses for the majors in information, communication and electronic engineering. This course covers the basic concepts of information theory including entropy, mutual information, channel capacity, information rate, Shannon's noiseless coding theorem, and Shannon's fundamental coding theorem. It aims to train the students to apply information theory to analyze and solve the practical problems in the areas of communication and information processing.

3112101970<Information System Design> Course Description

Course: Information System Design

Course No.: 3112101970

Credit / Course Hours: 3/48

Preparatory Course: Electronic and Circuit Foundation, Digital System Design, Comprehensive Experiment of Programming

Course Description: As a professional basic course of information engineering, this course is based on the CDIO teaching mode of education, form a team to cultivate students' ability, realization of information system, including the ability of technology and other aspects of the non-technology factors, design, realization, application and engineering. Through this course, students can make the construction of information system, application oriented training in the implementation of information system with engineering thinking, grasp the typical information system design and development case, familiar with the design of hardware and software realization method, cultivate teamwork and communication skills, considering the non-technical factor consciousness, solve the problems in complex engineering foundation for the further course of study of information engineering, lay the foundation in the field of information theory research and engineering work.

3112101980<Modeling and Simulation of Information Networks> Course

Description

Course: Modeling and Simulation of Information Networks

Course No.: 3112101980

Credit / Course Hours: 2.5/40

Preparatory Course: Probability Theory and Mathematical Statistics, C/C++ Programming

Course Description:

Modeling and Simulation of Information Networks is a fundamental and compulsory course for students who major in Information Engineering and supports the No.2, No.3 and No.5 of the graduation requirements in the training program.

As a basic course for students major in information engineering, the course covers the fundamentals, methodology and practice of modeling and simulation for information network, including discrete events driven simulation, methods to generate random variables and stochastic processes in computers, information network simulation tools, modeling and simulation method of the main modules in information network, experiments on modeling and simulation for modules and comprehensive experiments, and so on. The students can master the basic concepts on modeling and simulation of information networks, cultivate their engineering-thinking in information network system design and master the methodology on modeling and evaluation for typical information network systems. This course will lay a solid foundation for learning the successive courses related information network and working on related projects.

3112102190<Frontier Technologies in Information and Communications>

Course Description

Course: Frontier Technologies in Information and Communications

Course No.: 3112102190

Credit / Course Hours: 1 /16

Preparatory Course: Principles of Communications I, Digital Signal Processing

Course Description: This course aims to present frontier technologies in information and communications in a wide range of topics, including wireless communications, mobile communications and optical communications, as well as new emerging ones such as mobile internet, internet of things, big data and artificial intelligence. Through the study of this course, the students should have a comprehensive

understanding of the ins and outs of these new technologies and be familiar with literature search tools to obtain the international trends of research and development on special topics. It also helps to train the students to enhance their creative awareness and develop their ability of life-long learning.

3112102200<Simulation and Modeling of Multimedia Systems> Course

Description

Course: Simulation and Modeling of Multimedia Systems

Course No.: 3112102200

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Digital Signal Processing, Principles of Communications I, Principles of Digital Audio and Digital Video

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the multimedia communication systems. The content of the course covers analyzing of multimedia data compression, multimedia synchronization methods, multimedia networks, multimedia terminals and systems including network-layer QoS technology and real-time transportation protocols, modeling and tools for multimedia network simulation based on discrete event system simulation methods and Monte Carlo methods.

3112102540<Modeling and Simulation of Communication Systems> Course

Description

Course: Modeling and Simulation of Communication Systems

Course No.: 3112102540

Credit / Course Hours: 2/32

Preparatory Course: Principles of Communication I, Signals and Systems

Course Description:

This course “Modeling and Simulation of Communication Systems” is a subsequent course of “Principles of Communication”. After mastering the fundamental theories and key problems in communication principles, students will be able to establish the concept of communication systems, master the communication modeling and simulation methodologies through the study of this course.

This course introduces the information collection, receiving and processing ways, methods and

application examples by the combination of software defined radio hardware and software programming. The main contents of this course include analog modulation and demodulation methods, modeling and simulation of digital communication, receiving and analysis of complex wireless signals, analysis of complex problems in engineering practice of communication system and etc. Through the study of this course, students will be able to establish deep understanding of communication related theoretical knowledge, be educated the engineering practical ability, be clear of the problems to be solved in engineering practice of communication system, master the implementation schemes of typical communication technologies, be familiar with the key parameters and simulation methods of communication system's performance, so that, the students will have firm fundamental ability to pursue further research and development of engineering practice technologies in communication area.

3112180030<Information Theory and Coding> Course Description

Course: Information Theory and Coding

Course No.: 3112180030

Credit / Course Hours: 2/32

Preparatory Course: Probability and Statistics

Course Description:

Information theory employs Probability Theory and Stochastic Process to find fundamental limits on reliably storing and transferring data. This course covers the basic concepts of information theory including entropy, mutual information, channel capacity, information rate, Shannon's noiseless coding theorem, Shannon's fundamental coding theorem and rate-distortion theory. It aims to train the students to apply information theory to analyze and solve the practical problems in the areas of telecommunication and information processing. There are also some discussions about limit theorems of information source and channel, and some contents about specific source coding algorithms: Huffman coding, Shannon coding, Shannon-Fano-Elise coding, Fano coding, run-length coding, arithmetic coding, general coding, and several kinds of channel coding schemes: quantization coding, orthogonal transformation coding and predictive coding. This course will establish a firm foundation for further learning of specific telecommunication technologies for the students.

3112100070<Random Signal Analysis> Course Description

Course: Random Signal Analysis

Course No.: 3112100070

Credit / Course Hours: two credits , 32hours

Preparatory Course: Probability and Statistics, Linear Algebra, Signals and Systems

Course Description:

This course is an engineering elective course which aims to give the students an introduction of the basic concepts, theory and methods of random variables, stochastic process and random signals. It covers the basic concepts of stochastic processes (Markov chain and Poisson process), linear systems with random inputs, and the basic principles of signal estimation.

3112100150<Basic Theories of Communication Networks> Course

Description

Course: Basic Theories of Communication Networks

Course No.: 3112100150

Credit / Course Hours: 2/32

Preparatory Course: Mathematical Analysis/Advanced Mathematics, Probability theory and mathematical statistics

Course Description: This course treats some of the theoretical problems involved in communication networks, such as the computation and analysis models of Poisson process, M/M and M/G queuing systems, and the network flows. After having a good knowledge of the basic mathematical models, students will learn the concepts of communication networks, study the algorithms to analyze the performance of networks, and master the analysis tools for the topology and reliability of communication networks, which will improve the students' capability of theoretical modeling and networks evaluation.

3112100200<Mobile Communication>Course Description

Course Number : 3112100200

Course : Mobile Communication

Credit(s) : 2 credits , 32 hours

Course Description : This course is an important optional specialty course for the students majoring in information engineering, communication engineering and electronic engineering. It covers the fundamental mobile communication theories and technologies of several mobile communication systems. The fundamental theory of mobile communication introduce the theory of radio wave propagation, modulation and source coding, anti-fading and the cellular concept; The technology of mobile communication systems introduce the GSM system and its enhanced system, the CDMA system (IS-95 and CDMA20001X), the 3G systems focusing on the basic technology for three protocols (WCDMA, CDMA2000 and TD-SCDMA) , the 4G systems - LTE and the developing on mobile communication in future.

Prerequisite(s) : Principles of Communications I

3112100210<Satellite Communications> Course Description

Course: Satellite Communications

Course No.: 3112100210

Credit / Course Hours: 2/32

Applicable Majors: Communication Engineering, Information Engineering, Electronic Information Engineering

Preparatory Courses: Principles of Communications I, University Physics

Course Description:

Satellite communication is a professional curriculum for the major of information and communication, which could cultivate the first four kinds of capacity required by electronic and information category.

This course mainly focuses on the fundamental concepts, principles, knowledge, and analysis of satellite communication. The main contents of the course cover the principle of satellite orbit, the components of satellite systems, the propagation effects of satellite channel, C/N budget of transmission link, modulation, coding and multiplexing of satellite communications, satellite networking, principle and system of positioning, receiver experiment, positioning experiment and simulation experiment.

This course focuses on the basic theory, engineering knowledge, and introduces some key problems of satellite communication as well as the methods to solve these problems. Through this course, the students

can learn to master the basic concepts of transmission and networking of satellite communication, and develop the students' engineering thought of information and communication, and strengthen their professional knowledge of solving communication problems. The students can also learn typical examples of design and development of satellite communication, and be familiar with key metrics or methods for the evaluation, analysis, measurement and simulation of the satellite communication. Also, they can apply the knowledge of information and communication to satellite communication and further lay a foundation for the research and engineering technology in the future working for satellite communication.

3112100240<Optical Network Technology> Course Description

Course: Optical Network Technology

Course No.: 3112100240

Credit / Course Hours: 2/32

Preparatory Course: Principle of Communications I

Course Description:

Optical Network Technology is a specialized course of optical communication for communication engineering, electronic engineering, information engineering and electronic information and other related professional field, which is based on Wavelength Division Multiplex (WDM) technology and focuses on the new generation optical network architecture and solutions. The topics of this course include the basic concept of optical network, switching modes, network structure and operating principle, Optical Transport Network (OTN) technology and network elements, network model and adaption for Optical Internet, basic concepts of elastic optical network and software defined optical network, control and management, design and analysis of optical network. This course will help student to understand the core direction of the architecture and solutions for next generation optical network, and to grasp the future optical network technology trends.

3112100250<Broadband Access Technologies> Course Description

Course: Broadband Access Technologies

Course No.: 3112100250

Credit / Course Hours: 2/32

Preparatory Course: Principles of Communications I

Course Description:

This course includes the basic principles, main-stream technologies and development trends of

broadband access technology in information and communication network, supporting 1-3 and 5 items of graduation requirements of electronic information class (information and communication) training program.

Broadband access technology is one of the enabling technologies in communication network, occupying an important position in the modern information communication network. As a specialized courses electronic information (Information Communication), this course focuses on the broadband access technologies, including the basic model/principle/trend of the access network, and the principles/key technology/trends of the stream access technologies (DSL technology, cable access technology, Ethernet access, optical access technology etc.). By this course, the students are required to be familiar with the basic concepts of broadband access technology and technical characteristics/key technology/ applications, to understand and to grasp the mainstream broadband access network, and to understand the emerging technologies of broadband access and the future direction of development, aiming to solid the foundation for the field of information and communication theory research and engineering.

3112100260<Computer Networks> Course Description

Course: Computer Networks

Course No.: 3112100260

Credit / Course Hours: 2/32

Preparatory Course: Introduction to Information and Communication Engineering

Course Description: This course will explain the principles and technologies of the computer networks and Internet, which mainly focuses on the information transmission, routing mechanism, protocols and network performance evaluation methods. The aim is to let the students understand the system structure , technologies and network programming methods for modern computer networks and Internet. It covers: principles of data transmission, transmission media, architecture of the computer networks, principles of LAN and its protocols, WLAN, packet switch, routing in WAN, multimedia networking and QoS, network performance evaluation, TCP/IP protocols and internetworking principles, principles of P2P and BT, sockets and network programming. This course is bilingual teaching.

3112100280<Communication Power Supply and Electromagnetic Environment> Course Description

Course: Communication Power Supply and Electromagnetic Environment

Course No.: 3112100280

Credit / Course Hours: 2/32

Preparatory Course: Electronic Circuit Foundation, Signal and System

Course Description:

This course is one of the important courses supporting the graduation requirements of electronic information (information and communication). It mainly supports the top two requirements of graduation programs for electronic information (information and communication) majors.

This course is divided into two parts. The first part introduces the communication power. It's mainly about power supply system Of Safety, energy saving and environmental protection, design method, basic principle and case analysis; The basic principle of modern communication power; High power and high frequency DC conversion technology and its typical topology analysis; PWM, PFM, analog and digital control; High frequency switching rectifier for communication; Soft switching technology and power factor correction technology; Automatic monitoring system. The second part introduces the electromagnetic environment. Through this part of the study, students can grasp the basic knowledge of the electromagnetic environment; understand the main content of electronic countermeasures and complex electromagnetic environment, and the relationship between the development of wireless communication network and the electromagnetic spectrum resources; learn the basic principles and methods of the electromagnetic spectrum division, and be familiar with the common radio transmitting equipments; master the basic content of electromagnetic compatibility and electromagnetic spectrum management; learn the international and domestic standards and monitoring methods of electromagnetic environment assessment. This part provides a theoretical basis for green development of electromagnetic environment in order, supports the planning and optimization of the new generation of the wireless communication network, and provides the basic guarantee for electromagnetic space strategy in cyber space.

3112100340<Embedded Operating System> Course Description

Course: Embedded Operating System

Course No.: 3112100340

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming

Course Description: Embedded operating systems play an important role in industrial area. This course teaches students (i) introduction to embedded operating system, (ii) hardware of embedded operating system, (iii) embedded operating system, (iv) development methods of embedded system, (v) WinCE operating system, and (vi) Android embedded operating system. Through teaching students these above mentioned knowledge, this course makes students grasp the architecture, principle of embedded operating systems, and master application development methods based on Android operating systems. Meanwhile, this course provides the experimental environment for the students to do experiments on application development based on embedded operating systems, and assigns students assignments on cutting and compiling kernels of embedded operating systems. Through the experiments and assignments, students' ability on developing applications based on embedded operating systems can be improved, their practice capability on cutting and compiling kernels of embedded operating systems can be enhanced, and their understanding on the source codes of embedded operating systems can also be enhanced. To sum up, this course is very useful for students' future career if they want to work on the field of embedded operating system development.

3112100360<Linux Operating System> Course Description

Course: Linux Operating System

Course No.: 3112100360

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming

Course Description: Students will learn basic concepts and operations of Linux from this course. Contents include basic principle of Operating System, Linux basics, usage of VI editor, common use commands, shell and shell programming, system maintenance, SED, AWK, C programming under Linux environment.

3112100370<Digital Signal Processor> Course Description

Course: Digital Signal Processor

Course No.: 3112100370

Credit / Course Hours: 2/32

Preparatory Course: Foundation of Electronic circuit, Digital System Design, Computer Principle and Application, Digital Signal Processing

Course Description: With the rapid development of information processing technology , digital signal

processor has been more widely used in the field of information, communication, automatic control, instruments, measurement and a variety of military and consumer electronics products. The purpose of this course is to enable students to understand the principle, usage and performance of DSP, master the hardware structure of the digital signal processing chip, get familiar with the digital signal processor software development method and software and hardware debugging tools.

3112100420<Pattern Recognition and Applications> Course Description

Course: Pattern Recognition and Applications

Course No.: 3112100420

Credit / Course Hours: 2/32

Preparatory Course: Linear algebra, Mathematical Analysis/Advanced Mathematics, Probability Theory and Mathematical Statistics

Course Description: Pattern recognition is to allow the computer to identify things. This course will introduce the fundamentals of statistical pattern recognition. The main contents include: basic concepts, theories and methods of pattern recognition. Details include: the composition of the pattern recognition system, some basic questions, Bayesian decision theory, probability estimation theory and methods, linear classifier, feature extraction and selection method, KNN algorithms, artificial neural networks, support vector machines. Typical applications of pattern recognition applications include speech recognition, image recognition, and text categorization.

3112100430<Mobile Internet> Course Description

Course: Mobile Internet

Course No.: 3112100430

Credit / Course Hours: 2/32

Preparatory Course: Introduction to Information and Communication Engineering

Course Description: This course gives a detailed description of mobile internet on its basic concepts, theories, development, state-of-art technologies and service applications. The students are required to have the comprehensive understanding and knowledge on the industrial chain of mobile internet, “terminal-pipeline-cloud” architecture and its key technologies, service types, security issues and its

solutions, and so on. This course focuses on the mobile terminal and its hot technologies, the typical mobile internet service platforms and cloud computing. In addition, it aims to train the students to develop the basic abilities of preliminary design on mobile internet services and skills in the relative fields.

3112100440<Java Programming> Course Description

Course: Java Programming

Course No.: 3112100440

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Data Structures and Algorithms

Course Description: As the most widely used computer language in the world for almost 20 years, Java can help student enjoy the tour of learning computer programming. In the course, the students will be familiar with the features of Java such as simple, object-oriented, distributed, robust, secure, architecture-neutral and portable, interpreted, multithreaded and dynamic. Start with the basics of Java, the course will go on to object-oriented basis and package, common classes, exception handling, input and output, multithread, network programming and graphical interface. By the time we're done, you'll be comfortable with Java programming and ready for more!

3112100450<Web Application Design & Development> Course Description

Course: Web Application Design & Development

Course No.: 3112100450

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Computer Principle and Application

Course Description: This course mainly focus on the general knowledge and techniques in Web or WWW programming. It aims to help students to understand and master the basic knowledge and design principle of Web applications, which include XHTML, CSS, XML, JavaScript, MySQL, PHP and etc. Also some popular Web application development tools will be introduced, as well as students will be trained to implement some real cases. This course is a good foundation for further study of other network courses.

3112100460<Practical software engineering> Course Description

Course: Practical software engineering

Course No.: 3112100460

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description:

Practical software engineering is a specialized course in computer programming, supporting the first four and the ninth of the graduation requirements in the training plan of Bei Yu Electronic Information (information and communication).

This course mainly includes the basic concepts and definitions of software engineering, the whole process of software engineering, UML and object-oriented programming, the concept and main application of software defined network (SDN), wireless access network architecture and key technologies in SDN architecture, Android Other concepts and programming ideas and so on. This course focuses on introducing the basic theory and engineering knowledge of software engineering, introducing the key issues of software design and the ideas and methods to solve these problems. Through this course, we can establish the concept of software engineering, understand the whole process of software engineering, master the design and development cases of typical software engineering, and lay the foundation for subsequent theoretical research and engineering work in software engineering.

3112100780<Web Search> Course Description

Course: Web Search

Course No.: 3112100780

Credit / Course Hours: 2/32

Preparatory Course: Data Structures and Algorithms, Probability Theory and Stochastic Processes

Course Description: Web search is the general term of theory, methods, techniques, systems and services of information processing on the World Wide Web. The main purpose is to address information retrieval, filtering and recommendation. It is one of the professional courses for the majors of information, communication and electronic engineering. This course covers the core issues, the basic concepts and methods of text retrieval, multimedia information retrieval, information filtering and recommendation, and

enables students to master the basic principles of search engine, web crawling, information preprocessing, indexing, querying and multimedia information retrieval techniques and to build a simple search engine system using open source software. It aims to train the students to apply web search theory to analyze and solve the practical problems in the areas of network information processing.

3112100810<Bioinformatics> Course Description

Course: Bioinformatics

Course No.: 3112100810

Credit / Course Hours: 2/32

Preparatory Course: Mathematic Analysis, Linear Algebra, Probability Theory and Statistics

Course Description: This course mainly focuses on the fundamental problems in bioinformatics, general mathematical models to formulate the problems, and efficient algorithms to solve the problems. The contents mainly cover but not limited to the following topics: a) basics in biology, b) sequence alignment and its applications, c) genome structure and gene annotation, d) hidden Markov model, e) phylogenetic reconstruction, f) gene expression data analysis, and g) protein structures and interaction inference, etc.

3112100880<Network Management> Course Description

Course: Network Management

Course No.: 3112100880

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: This course introduces modern network management technology, focusing on the telecommunications networks, computer networks and high-speed information network. The objective of the course is to enable students aiming at fully establishing the basic concepts of modern network management, master the basic principles, understand the key technologies, and learn development frontiers. This course includes three main models, the main function of the NMS and some the key technologies, including the OSI system management functions, traffic control, routing, network self-healing network and information security, intelligent network management.

3112100910<Network Traffic Monitoring> Course Description

Course: Network Traffic Monitoring

Course No.: 3112100910

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming

Course Description:

This course mainly focuses on the basic knowledge of network traffic monitoring, which is applied for Internet or general computer network. The content of the course covers monitoring the link layer, network layer, transport layer, application layer traffic from a PC or a network gateway, a variety of flow characteristics, xFlow traffic monitoring, traffic monitoring hardware, service analysis and user behavior analysis, network quality monitoring, traffic control and bandwidth management.

The goal of this course is to introduce classical network traffic monitoring techniques and solutions. The teaching key point is to master specific network traffic monitoring tools. Through the study of this course, students can acquire the ability to use existing tools or programs for network traffic monitoring, and lay the foundation for further learning and practice in Internet field.

3112101620<Software-Defined Networking> Course Description

Course: Software-Defined Networking

Course No.: 3112101620

Credit / Course Hours: 2/32

Preparatory Course: C / C ++ Programming

Course Description: This course mainly introduces the system architecture and key technologies of software defined networking, including the background, architecture module, core protocols, key technologies and business applications. Through this course, students can establish the basic concepts of software defined networking, cultivate the technical and engineering thinking of software defined network, consolidate the conceptual basis of studying software defined networking problems, master the design and development cases in typical software defined networking system, familiar with the key indicators of software-defined networking system and its methods of analysis, measurement and simulation, make foundation for the further study of information and communication and network-related professional

courses, and work in the field of information and communication and network theory and engineering.

3112101660<Key Technologies of 5G> Course Description

Course: Key Technologies of 5G

Course No.: 3112101660

Credit / Course Hours: 2/32

Preparatory Course: Signal and System, Probability Theory and Stochastic Processes, Principles of Communications I

Course Description:

The key technologies of 5G is a compulsory course for the plan of the “double style teachers” and the bachelor degrees on the communication engineering (with emphasize on 5G), in support of the first, second, third, fourth and sixth bachelor graduation requirements.

With the variety of scenario of future wireless communication, mobile traffic demand is non-uniformed in temporal and spatial domain. Traditional wireless communication infrastructure deploys macro-base stations to provide basic coverage, however, this cannot cope with the challenges for explosive increase of traffic demand. Ultra dense heterogeneous networks have become a key technique to enhance data traffic in 5G network. This course makes students learn more about the basic technique and research progress of 5G communication. Contents of this course includes model of ultra-dense networks, deployment scenario, limitation of capacity and resource allocation, etc.

3112101710<Machine Learning> Course Description

Course: Machine Learning

Course No.: 3112101710

Credit / Course Hours: 2/ 32

Preparatory Course: Probability Theory and Mathematical Statistics, Linear Algebra, C/C++ Programming

Course Description: This course will provide a comprehensive introduction to the field of Machine Learning. Specifically, the course will introduce some fundamental machine learning models and algorithms, including supervised classification and unsupervised clustering models, Bayesian decision

theory, metric learning algorithms, artificial neural network and recent deep learning models. The objective of this course is to build up a broad scope of machine learning and perception for students, as well as to extend thinking and practical ability of students when they face specific data analysis problems.

3112101720<Data Visualization> Course Description

Course: Data Visualization

Course No.: 3112101720

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Data Structures and Algorithms

Course Description: As a basic course for computer and electronic information, this course mainly focus on the basic theory and concept of visualization, introduce the corresponding visualization methods for different types of data encountered in practical applications, and introduce the comprehensive application and practical system of visualization. Through the teaching of this course, students can have the ability of visualizing data and information, grasp the general principles and processing methods of data visualization, and visualize data with practical visualization software and tools. Through the course of learning, students will understand the basic concept of data visualization and the principle of visual encoding of data perception and cognition. Students will also process the skills of data definition, organization, management, analysis, mining and data workflow. Moreover, students will comprehend the theory of visualization and the visualization methods used in different types of data, and equipped with skill of applying visualization software.

3112101790<Introductions to the Industrial Internet> Course Description

Course: Introductions to the Industrial Internet

Course No.: 3112101790

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description:

This course introduces background, concept, nature, connotation and driving force of “Internet+”, points out the prospects and opportunities of industrial Internet development, and its impact on human

production and lifestyle. The main contents of the course include the architecture of industrial Internet, key technologies and application scenarios, which are as follows:

Architecture: sensory systems, nervous systems, brain platforms, and limb tools;

Key technology: Internet+, CPS, Ubiquitous Access, IoT, Cloud, Industrial Big Data, Social Physics,

Network Science, Software Defined Anything, AI, etc;

Application scenarios: typical applications in finance, transportation, tourism, automobile, logistics, security, manufacturing, medicine, etc.

Learning this course can understand four types of technologies: perception of everything, information transmission, platform construction and data analysis, comprehend the new model of Intelligent manufacturing such as interconnection, collaboration, flexibility, customization, and cultivate Internet innovative thinking such as ubiquitous connectivity, data drive, shared services, cross-boundary integration.

3112101950<Fundamentals of Data Science> Course Description

Course: Fundamentals of Data Science

Course No.: 3112101950

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Mathematical Statistics, Introduction of Data Structures and Algorithms

Course Description: This course demonstrates the general principles of data science in engineering application. Introduce the benefits, basic principles and methods of data/big data analysis. This course mainly includes the flow and methods of big data analysis, machine learning, basic theory of statistical analysis, big data analysis tools, big data product development, and the classical examples of big data analysis. This course mainly focuses on the basic theory and project knowledge of data science, the key problems in big data analysis, and the ways and schemes to solve those problems. By the studying of this course, students can grasp the basic concepts of data science, enhance the project thinking capability in big data analysis, strike a solid theoretical foundation in big data analysis, utilize the main data analysis technologies and tools, get familiar with the management rules, methods, and typical examples in data science project. This course helps students to prepare for learning the following professional courses related with data science, and lays a foundation for the theoretical research and engineering project in data science area.

3112101990<Microwave and Antenna Technology> Course Description

Course: Microwave and Antenna Technology

Course No.: 3112101990

Credit / Course Hours: 2/32

Preparatory Course: Electromagnetic Fields and Waves

Course Description: This course mainly focuses on fundamental theory and principle of the transmission line theory, Smith chart, microwave network, microwave elements and antenna. To make students understand the theories more deeply and exercise their analysis and design ability, there are several microwave experiments. This course aims to make students understand the fundamental theory and principle of up-to-date microwave and antenna technology, which is the foundation of the design of RF circuits, wireless communications, optical fiber communication, satellite communication, and so on.

3112102000<Optical Communication Systems> Course Description

Course: Optical Communication Systems

Course No.: 3112102000

Credit / Course Hours: 2/32

Preparatory Course: Electromagnetic Field and Electromagnetic Wave, Principles of Communications I

Course Description: This course mainly focuses on the general concepts, principles and knowledge of the optical communication systems. The content of the course covers transmission characteristics of optical fiber, principles of laser diode and photo diode, design and performance evaluation of optical fiber communication system, optical amplifier, wavelength division multiplexing, coherent optical communication, optical wireless communication and the measurement of optical communication systems. This course aims to train the students to understand how to analyze and solve the practical problems in the optical communication systems.

3112102010<Network Security Technology> Course Description

Course: Network Security Technology

Course No.: 3112102010

Credit / Course Hours: 2/32

Preparatory Course: Data Structures and Algorithms

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the security problems in computer networks. The content of the course covers TCP/IP introduction, cryptography and cryptographic protocols, firewalls, and network denial-of-service attacks and defenses; user authentication technologies; security for network servers; computer virus, intrusion detection; techniques to provide privacy in Internet applications.

3112102020<Internet of Things technology>Course Description

Course: Internet of Things technology

CourseNo.:3112102020

Credit / Course Hours: 2/32

Preparatory Course: Principle and Application of Computer, Principles of Communications I

Course Description:

This course focuses on teaching the key technologies, including wireless sensor network technology, heterogeneous network technology, RFID technology, Internet and cloud computing technology, and other key technologies of Internet of things. The course includes the following main contents: The concept, the layered architecture and the key technologies of IoT; Analysis of data link layer protocol of wireless sensor network, wireless sensor network routing protocol, sensor network topology management and positioning and synchronization technologies; Handover technologies of heterogeneous wireless network and schedule making method; Cloud computing and the main technical methods; Key technologies such as transmission principle, signal encoding and modulation, the interface standard and protocol of RFID; Infrared identification and barcode technologies; Security technologies of wireless data; Application layer protocol analysis; Development trend and successful cases of networking and wireless sensor networks. Meanwhile, the course aims to train the thinking methods of IoT engineering, thus mastering the design of the key technologies of Internet of things.

3112102030<High-Speed and Programmable Networked Systems> Course Description

Course: High-Speed and Programmable Networked Systems

Course No.: 3112102030

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Data Structures and Algorithms

Course Description: This course mainly focuses on the architecture and key data structures design as well as the fast prototyping of the data plane of high-speed networked systems such as switches and routers. The content of the course covers router architecture, route lookup algorithm, packet classification algorithm, router buffer design and analysis, queuing and scheduling, switch fabric design, data plane programmability, Linux-based router prototyping and protocol-independent forwarding using the P4 language, etc. Students are expected to learn the design principles and system trade-offs to construct high speed networked systems under the limited software/hardware resources. Students are also expected to learn the elementary theories to quantitatively analyze the high-speed networked systems.

3112102040<Data Center and Cloud Computing> Course Description

Course: Data Center and Cloud Computing

Course No.: 3112102040

Credit / Course Hours: 2/32

Preparatory Course: Data Structures and Algorithms, Probability Theory and Stochastic Processes

Course Description: This course mainly focuses on the general concepts, principles, knowledge and analyzing of the data center, cloud computing system and edge computing. The emerging demand for web services and cloud computing have created need for large scale data centers. The hardware and software infrastructure for datacenters critically determines the functionality, performance, cost and failure tolerance of applications running on that datacenter. The content of the course covers data center network topologies, transport layer protocols, load balancing mechanisms, virtualization technologies, network virtualization, data center resource sharing, network programming language and advanced transport mechanisms.

3112102050<Multimedia Technology and Application>Course Description

Course : Multimedia Technology and Application

Course Number : 3112102050

Credit(s)/Course Hours : Two credits, 32 hours

Preparatory Courses : Computer Principles and Applications

Course Description: This course mainly provides concepts, models, techniques and applications of multimedia technology. Topics include the fundamentals of multimedia, video editing, media file processing, video streaming, computer animation, and multimedia presentation. Using wireshark matlab and other tools, students can create materials that incorporate text, animation, images, sound, and video. The course aims to equip students with strategies for enhancing their skills.

3112102060<Digital Media Manufacture Technology> Course Description

Course: Digital Media Manufacture Technology

Course No.: 3112102060

Credit / Course Hours: 2/32

Preparatory Course: Principle of Digital Audio and Video

Course Description: This course mainly focuses on the manufacture technology of digital media. The content of the course covers the basic principle of digital media manufacture and software, such as Photoshop, Virtual Reality, Augmented Reality and so on. The digital media manufacture workflow will be introduced in this course and one production will be required in this course. The course aims to provide the concept of overall digital media manufacture process.

3112102070<Digital Media Broadcasting> Course Description

Course: Digital Media Broadcasting

Course No.: 3112102070

Credit / Course Hours: 2/32

Preparatory Course: Principles of Communications I , Signal and System, Electronic and Circuit Foundation

Course Description: This course mainly focuses on the basic concepts, key technologies, components and principles of digital media broadcasting and digital TV systems. The content of the course covers the theory of video compression coding, syntax of Transport Stream bitstream , multiplexing method of SPTS and MPTS, SI and analyzing of Transport Stream.

3112102080<Virtual Reality Principle and Technology> Course Description

Course: Virtual Reality Principle and Technology

Course No.: 3112102080

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Introduction of Data Structure and Algorithm

Course Description: Virtual reality utilizes computer and advanced input/output devices to generate a three-dimensional cyberspace in which users can act freely just as in the daily life with the senses of hearing, sight, touch, smell, and even taste. This course covers the principle, basic algorithms, and typical systems of virtual reality, accompanied by some demos. It introduces the software and tools commonly used in the development of virtual reality systems through a case study of a three-dimensional game. Also, the hot topics in the research community of virtual reality are investigated which can broaden the students' vision.

3112102090<Computer Vision> Course Description

Course: Computer Vision

Course No.: 3112102090

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Stochastic Processes, Linear Algebra

Course Description: This course provides an introduction to computer vision, including fundamentals of image formation, feature extraction, representation and matching, stereo, motion estimation and tracking, image classification and semantic segmentation, scene understanding, and deep learning with neural networks. We will develop basic methods for applications that include finding known models in images,

depth recovery from stereo, camera calibration, image stabilization, automated alignment, tracking, boundary detection, and recognition. We will develop the intuitions and mathematics of the methods in class, and then learn about the difference between theory and practice in projects.

3112102100<The Management of Digital Media> Course Description

Course: The Management of Digital Media

Course No.: 3112102100

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming, Data Structures and Algorithms

Course Description: Digital media management employs scientific technologies to efficiently plan, organize, store, retrieve, and reuse the digital media as well as protect the copyright. This course covers basic knowledge of coding processing, metadata, file format, data storage, distributed multimedia system, system infrastructure and architecture, system integration, content-based image retrieval and digital rights management of digital media management system. It aims to train the students to grasp the principle and key technologies of a digital media management system.

3112102110<Audio Signal Processing> Course Description

Course: Audio Signal Processing

Course No.: 3112102110

Credit / Course Hours: 2/32

Preparatory Course: Digital Signal Processing

Course Description: This course introduces the basic principle and method of audio signal processing, and it also introduces the new achievements, new development and new technology in recent years. It shows the basic theory and algorithm of audio signal processing to students. This course makes students contact area of the current important research topic, as well as cultivate the ability of independent research and thinking, enhance students' comprehensive ability the application of knowledge, and lay the foundation for their further study and work. The main contents of the course are summarized the basic knowledge of audio signal processing, acoustics, audio signal time-frequency analysis, audio encoding, audio scene recognition, watermarking etc..

3112102120<Mobile Multimedia> Course Description

Course: Mobile Multimedia

Course No.: 3112102120

Credit / Course Hours: 2/32

Preparatory Course: Information Theory, Principles of Communications I

Course Description: This course mainly focuses on the general concepts, principles, and key techniques of the signal processing and transmission of mobile multimedia. The contents of the course are the fundamental theories, key techniques and designs of mobile information networking, multimedia audio/video processing and transmission. Upon completing this course, the student will be able to learn the elements of the general mobile multimedia system, the designs of typical mobile multimedia application systems and the corresponding evaluation metrics and methods. The course will prepare the student to perform further research and development in the area of mobile multimedia information processing and transmission.

3112102130<Natural Language Understanding> Course Description

Course: Natural Language Understanding

Course No.: 3112102130

Credit / Course Hours: 2/32

Preparatory Course: Probability and Mathematical Statistics

Course Description:

This course mainly focuses on the general concepts, principles, knowledge and the latest research advances about the natural language understanding. The content of the course covers Chinese word segmentation, named entity recognition, machine translation, automatic summarizing, document classification, question-answering system, information extraction, text mining, conversation system, and so on.

3112102140<Social Network Analysis> Course Description

Course: Social Network Analysis

Course No.: 3112102140

Credit / Course Hours: 2/ 32

Preparatory Course: Probability Theory and Mathematical Statistics, Linear Algebra

Course Description: This course will combine the aspects of social network analysis with machine learning algorithms and models to introduce the characteristics and structures of large social networks as well as the recent developments about typical network models (e.g., random graph model, small-world model, scale-free model), information diffusion and cascading in social networks, link prediction models as well as the community detection models. Through the lectures and projects, students will explore how to practically analyze large-scale network data and how to apply related models and algorithms in real world applications when they face specific social network data analysis problems.

3112102160<Information Processing and Coding> Course Description

Course: Information Processing and Coding

Course No.: 3112102160

Credit / Course Hours: two credits, 32hours

Preparatory Course: Principles of Communication I, Information Theory

Course Description:

The course of Information processing and coding mainly introduces the basic principles and methods of the implementation and optimization of communication systems. This course covers three key concepts of communication system: efficiency, security and reliability. First, source coding theorems, pragmatic construction algorithms such as Huffman code and arithmetic code, and practical applications are presented. Second, classic and modern cryptograph theory and methods, i.e., RSA algorithm are explained. Finally, encoding methods and decoding algorithms for the linear block codes and convolutional codes are illustrated. The aim of this course is training the students to apply information processing and coding theory to analyze and solve the engineering problems in the areas of communication system design.

3112102170<Python Programming>Course Description

Course: Python Programming

Course No.: 3112102170

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: Python is one of the most powerful script programming languages available, which is widely used in practical programming tasks including text processing, data mining, web development, etc. This course aims to give students an introduction to the Python language, from basic constructs to program structure to advanced programming concepts. It covers the fundamentals of Python, such as data types, control structures, tuples, list, collection, dictionary, functions, classes and concepts of object-oriented programming. It is one of the fundamental courses for the majors in information, communication and electronic engineering. This course will enable students to use this language effectively in their courses, researches and future works

3112102180<Database System and Cloud Storage> Course Description

Course: Database System and Cloud Storage

Course No.: 3112102180

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming

Course Description: This course mainly focuses on database system concepts, relation database principles, SQL language, the theory of relation database design, database management system and application.

On understanding of the database system concepts, a student of non-computer majors will do data definition, manipulation and control, also finish modeling, designing, indexing, optimizing, concurrent and transaction management of databases.

Students need to understand what is database, parallel design, cloud storage, large data development and NOSQL, to know how to solve some simple problem about database management and processing, to lay the foundation for studying on data mining, AI and other related courses, to gain programming experience and skills for database design, development and research in the future.

3112102560<Inference and Information> Course Description

Course: Inference and Information

Course No.: 3112102560

Credit / Course Hours: 2/32

Preparatory Course: Probability Theory and Mathematical Statistics

Course Description:

This course demonstrates the general principles of inference in engineering application. To study the statistical detection and inference based on probability and stochastic processes, the emphasis is on the common foundations and conceptual frameworks for inference problems in various fields of application, ie to understand general hidden states of the objects we are interested in from observable data. It enables students to understand and master the probability representation and basic methods of statistical inference, information measurement, hypothesis testing, parameter estimation and graph models to lay a solid theoretical foundation for the follow-up professional courses.

The main contents include Bayesian testing and estimation, non-Bayesian testing and estimation, sufficient statistics, information entropy, mutual information, information divergence representation, data processing inequality, stochastic approximate reject sampling method, Markov Chain Monte Carlo method, representation of probability graph model, minimum independence-map, conversion of different graph models.

3112190059<Microwave & Optical Transmission> Course Description

Course: Microwave & Optical Transmission

Course No.: 3112190059

Credit / Course Hours: 3/48

Preparatory Course: University Physics, Electromagnetic Fields and Waves

Course Description: This course studies the theoretical and practical systems of microwave applications. As a specialized course of electronic information (information and communication), the purpose of this course is to train students' basic professional technology, master the main principles and methods of microwave and optical transmission. Through this course, the students can get the system design methods, the optimization theory of microwave communication system, which enable students to master the basic

theory of impedance matching, microwave network and microwave devices, understand the application of these basic principle in practical communication and information system.

3112100960<Electronic Process Practice> Course Description

Course: Electronic Process Practice

Course No.: 3112100960

Credit / Course Hours: 2/2 weeks

Preparatory Course: Electronic and Circuit Foundation, Digital System Design

Course Description: This course mainly focuses on the basic theory and engineering knowledge in the design and production of small electronic products, and expects to experience the processes and processes in the design, manufacture, installation, commissioning and testing of electronic products. After the course learning, the students could establish the concept of engineering, understand engineering aspects, engineering methods, train engineering thinking, improve engineering quality, consolidate theoretical foundation, and have the ability of preliminary design, development, of electronic products testing.

3112100991<Principles of Communications Laboratory>Course Description

Course: Principles of Communications Laboratory

Course No.: 3112100991

Credit / Course Hours: 1/24

Preparatory Course: Principles of Communications I

Course Description: This course is the lab experiments designed for the course “Principles of Communication”. This course uses modularized software or hardware platforms to build simple communication systems. Through the whole process of designing, setting, testing, measurements and trouble-shooting of the simple systems, the students can be trained to have a better understanding of the basic principle of communications, to be enforced in the capability of hardware and software designing and testing. The contents of lab experiments cover digital and analog modulations, digital baseband

transmissions, digitization of analog signals and etc.

3112100992<Principles of Communications Laboratory>Course

Description

Course: Principles of Communications Laboratory

Course No.: 3112100992

Credit / Course Hours: 0.5/12

Preparatory Course: Principles of Communications I

Course Description: This course is the lab experiments designed for the course “Principles of Communication”. This course uses modularized software or hardware platforms to build simple communication systems. Through the whole process of designing, setting, testing, measurements and trouble-shooting of the simple systems, the students can be trained to have a better understanding of the basic principle of communications, to be enforced in the capability of hardware and software designing and testing. The contents of lab experiments cover digital and analog modulations, digital baseband transmissions, digitization of analog signals and etc.

3112101010<Professional Internships> Course Description

Course: Professional Internships

Course No.: 3112101010

Credit / Course Hours: 2/2 weeks

Preparatory Course: Principle of Communication I, Modern Communication Technology, Electromagnetic Field and Electromagnetic Wave, Signal and System

Course Description:

Professional internships is an important part of specialty engineering practice for undergraduate students. It is also a significant component of higher education to explore quality-oriented education and cultivate students' creativity. Additionally, it focuses on engineering experimental teaching and promotes practice education. During the specialty practice, students can foster their basic skills of specialty practice and flexibly use learned theoretical knowledge after they basically understand fundamental theory and technology of electronics and information specialty. When participating in practice or simulation engineering projects, they can comprehend the application scenarios and locations of theoretical knowledge

and enhance the perceptual knowledge of real communication networks. Meanwhile, they can be aware of the rapid application development of new technologies in the contemporary communication and information industries and understand current information communication network, Internet, transport network. Furthermore, students can realize an important role of information communication in the national economy development by learning the production and operation rules of telecommunication and Internet enterprises, which can achieve the education purpose of basic engineering practice for students.

3112101351<Electromagnetic Fields Laboratory>Course Description

Course: Electromagnetic Fields Laboratory

Course No.: 3112101351

Credit / Course Hours: 1/24

Preparatory Course: Electromagnetic Fields and Waves

Course Description: Electromagnetic Fields Laboratory is an important practice part for the course of Electromagnetic Fields and Waves, which illustrates concepts and techniques in electromagnetic fields. The main contents include the followings.

- (1) Measuring the parameters of the electromagnetic waves and the uniform lossless medium.
 - (2) Researching the reflection and refraction of the electromagnetic waves.
 - (3) Analyzing the characteristics of the circular polarized waves.
 - (4) Researching the strength of the wireless signal fields on the campus.
 - (5)Introducing the basic principle and method of the spectrum analyzer, testing the spectrum distribution of the space wireless signals.
 - (6)E8000 spectrum characteristic measurement.
 - (7)Introduction of microwave simulation software (Microwave Office) and microstrip circuit.
 - (8)Design and Simulation of microwave circuits.
-

3112101681<Course Design of 5G Wireless Communications> Course Description

Course Number : 3112101681

Course : Course Design of 5G Wireless Communications

Credit(s) : Two credits , 48 hours

Prerequisite(s) : Principles of Communications I , Signals and Systems

Course Description :

This course is based on the knowledge associated to 5G wireless communications technologies and related prerequisite courses and for students to understand the knowledge of wireless communications theoretically and practically. Students will fulfill the tasks and contents of some certain course excises independently. This process trains their talent in resolving theoretical and practical problems in 5G wireless communications and prepares for further study on wireless communication.

3112102210<Engineering Acquaintance Practice>Course Description

Course: Engineering Acquaintance Practice

Course Number: 3112102210

Credit(s)/Course Hours: 0 credits , 8 hours

Preparatory Courses: None

Course Description: This course supports the 2.1, 6.1 and 8.3 items of the graduation requirement for the education program of electronic information specialty by helping students deeply understand the specialty development of electronic information, namely information and communication, when students visit the corresponding information technology. During the course, students will familiarize the field of information and communication, and develop perceptual knowledge of their specialty. Additionally, this course mainly includes visiting related museums, institutes, data processing centers and studios. The course focuses on assisting students to understand the basic operation and rules of production practice in their specialty and develop their work ethics.

3112102220<Metalworking Practice> Course Description

Course: Metalworking Practice

Course No.: 3112102220

Credit / Course Hours: 1/16

Preparatory Course: None

Course Description:

Metalworking is an important practical course for telecommunication engineering, information engineering, and electronic information engineering majors. In this practice course, the students will know the general process of mechanical manufacturing well, comprehend the main technique and process of metalworking, learn how to use all kinds of equipment and tools safely, understand the new processes and technologies in machinery manufacturing. The students will learn and practice the cold/hot processing methods with the aid of the drawings. This course trains students to form good habits of following rules. Through this course, the students will set up safety consciousness and enhance practical ability of engineering. This course can lay a good foundation for further study for students.

3112102270<Comprehensive Experiment of Programming> Course

Description

Course: Comprehensive Experiment of Programming

Course No.: 3112102270

Credit / Course Hours: 2/48

Preparatory Course: C/C++ Programming, Data Structure and Algorithm Introduction

Course Description: This course introduces the program specification and design, and problem solving using the C/C++ language. This course provides students with a comprehensive study of the software developments, including procedure-oriented program design, object-oriented program design, algorithm development, and graphical user interface development. With lab exercises, it aims to train the students to implement whole simple applications from design to coding, and debugging. This will enable students to program effectively in their after courses, researches and future works.

3112102280<Modern Communications Technology Laboratory> Course

Description

Course: Modern Communications Technology Laboratory

Course No.: 3112102280

Credit / Course Hours: 1/24

Preparatory Course: Modern communications technology, Information and Communication Technology Frontier

Course Description:

This course is the practical course corresponding to the course of "modern communication technology".

This course helps to deepen the understanding of the basic theories and basic analysis methods of modern communication technology. Through the operation and configuration of communication equipments, we can gain preliminary practical experience and understand the system parameters, indicators and other testing methods. To achieve or simulate the interconnection of equipment, from the perspective of perception to deepen the information and communication network layered architecture (end-to-end) and network integration system understanding, lay the foundation for further study and research.

3112102290<Course Design of Digital Signal Processing System and

Application> Course Description

Course: Course Design of Digital Signal Processing System and Application

Course No.: 3112102290

Credit / Course Hours: 2/48

Preparatory Course: Computer Principle and Application, Digital Signal Processing

Course Description:

This course introduces the hardware structure of digital signal processing chip, software development method of digital signal processor, and the use of software and hardware debugging tools. This course gives students a mastery of the basic principles and methods of design and implementation of the DSP system, cultivates students' ability to use DSP to develop and solve practical problems. Through the design and implementation of digital filtering, spectrum analysis, generation and detection of digital signals and so on, the course trains students to complete the design of experiment plan for complex engineering problems, collect and arrange experimental data, and analyze comprehensively the experimental results.

3112102300<Course Design of Digital Logic and Microprocessor System>

Course Description

Course: Course Design of Digital Logic and Microprocessor System

Course No.: 3112102300

Credit / Course Hours: 2/48

Preparatory Course: Digital System Design, Computer Principle and Application

Course Description: Course Design of Digital Logic and Microprocessor System aims at improving the capacity to analyze, design and solve practical problems by using both advanced technology methods and theoretical knowledge of digital logic and computer principle and application. This course supports the fourth item of graduation requirements in the electronic information training plan (information and communication).

The core content of this course is the design and completion of FPGA-based microprocessors with hardware description languages. This course emphasizes on the theoretical knowledge utilization of digital logic and computer principle and application to design the microprocessor with a complete system instructions structure. It helps students establish basic concepts of computer system, obtain the basic methods of computer design, cultivate the capacity to systematically analyze and solve practical problems. It not only improves the FPGA-based hardware design and simulation debugging ability with hardware description languages, cultivates hardware system design, debugging, operating management and other multiple skills, but also trains the ability of engineering design and innovative technologies utilization.,

3112102310<Course Design of Network Management & Control> Course

Description

Course: Course Design of Network Management & Control

Course No.: 3112102310

Credit / Course Hours: 2/48

Preparatory Course: Introduction to Information and Communication Engineering

Course Description: This course aims to strengthen the understanding of basic concept and principles of network management and control, master the basic principles, the key features of network management and

the configuration, operation and management of universal network devices. This course covers usage of basic network testing tools, method of accessing to the SNMP MIB of managed object, verification and analysis of SNMP protocol, probe and scan of the network resources, configuration and operation of popular network management system, network design and configuration management of network devices.

3112102320<Course Design of Information Processing and Coding> Course Description

Course: Course Design of Information Processing and Coding

Course No.: 3112102320

Credit / Course Hours: two credits, 48hours

Preparatory Course: Principles of Communications I, Information Theory

Course Description:

The Course Design of Information Processing and Coding mainly focuses on the practical implementation of communication systems. This course covers three key applications of communication systems: source coding, cryptogram coding and channel coding. First, pragmatic construction algorithms such as Huffman code and arithmetic code, and universal coding are required to design. Second, classic and modern cryptogram coding algorithms, such as, DES and RSA algorithm are implemented. Finally, encoding methods and decoding algorithms for the linear block codes and convolutional codes are illustrated. The aim of this course is training the students to analyze and solve the engineering problems in the areas of communication system design.

3112102330<Course Design of Computer Communication and Network>

Course Description

Course: Course Design of Computer Communication and Network

Course No.: 3112102330

Credit / Course Hours: 2/48

Preparatory Course: Introduction to Information and Communication Engineering

Course Description:

This course is a practical course which requires students to learn the basic operation and configuration of routers, LAN switches, firewalls, servers and other equipment. 6 students are required to form a group to complete the course work. Every team needs to select a networking scene, make a plan, analyze the requirements, choose the equipments, account the cost, complete the networking design, and set

up network applications accordingly.

The computer communication and computer network theory can be preliminarily verified. Through practice the students can deepen the understanding and improvement of theory, form a relatively systematic understanding of modern computer communication networks, and also basically grasp the planning, design, configuration and maintenance of small and medium-sized networks, preliminary understanding of the planning, design, configuration, maintenance and other content of medium and large networks. It can accumulate engineering practice experience, also train students' skills in problem solving, teamwork and communication, and time management, etc.

3112102340<Course Design of Mobile Internet Application Development>

Course Description

Course: Course Design of Mobile Internet Application Development

Course No.: 3112102340

Credit / Course Hours: 2/48

Preparatory Course: Introduction of Information and Communication Engineering, Design Thinking and Innovation Method, C/C++ Programming

Course Description:

This course focuses on the requirement analysis, product design, program development, program debugging and testing, and user testing of mobile internet services. The course requires students to grasp user-centered design methodology, UI fast-prototyping tools, Web developing languages and framework to establish innovative mobile internet end-to-end applications.

3112102350<Course Design of Electronic Circuits and Systems>Course

Description

Course: Course Design of Electronic Circuits and Systems

CourseNo.: 3112102350

Credit / Course Hours: 2/48

Preparatory Course: Introduction to Information and Communication Engineering, C/C++ Programming, Electronic and Circuit Foundation, Digital System Design, Signals and Systems

Course Description:

This course is an integrated course of circuits and system designs and experiments, which supports the 3th, 4th and 10th graduation requirements in Electronic Information (Information Communication) training program.

Through the study of this course, students can consolidate and deepen the understanding of the introductory courses, such as Introduction to *Information and Communication Engineering*, *Electronic and Circuit Foundation* and *Digital System Design*; obtain the ability of using C language, hardware description language Verilog and other common software and hardware programming languages combined with the microcontroller and programmable logic devices for integrated circuit design, and make students get full exercise in the aspects of circuit design, system building, hardware debugging, and so forth; develop students' ability to find problems and solve problems independently; strengthen the engineering quality training; train students' sense of teamwork through group work and improve students' ability of cooperation and coordination.

3112102360<Course Design of Big Data Application and Development>

Course Description

Course: Course Design of Big Data Application and Development

Course No.: 3112102360

Credit / Course Hours: 2/48

Preparatory Course: Data Analysis Tools

Course Description:

This course requires 6-10 students to build a team together to complete.

This course is a practical course, introducing the basic concepts and methods of big data analysis, data acquisition and preprocessing, system architecture, etc. It needs preliminary research, requirements analysis, program design, platform deployment and configuration, progress management to master the development of big data application, as well as the data processing and result analysis.

This course can validate the concepts, methods and models in data science, deepen the understanding of data science theory, and train students to use the method of big data analysis in practice to solve issues encountered.

By this course, it is necessary for students to master the framework, design, configuration and

maintenance of big data analysis system. Through the project designing and development, it can accumulate the engineering experience, cultivate students' team awareness, project management and autonomous learning ability.

3112102370<Course Design of Digital Audio Production and Coding>

Course Description

Course: Course Design of Digital Audio Production and Coding

Course No.: 3112102370

Credit / Course Hours: 2/48

Preparatory Course: Digital Signal Processing, C/C++ Programming

Course Description:

Digital audio plays an important role in film & TV, network gaming, and digital entertainment. This course is one of the practical courses for the majors in information and communication engineering. Based on the basic knowledge of acoustics, psychoacoustics, and room acoustics, this course covers the basic workflow for digital audio production including audio recording, noise reduction, audio effect rendering and non-linear editing. After introducing the concepts of sampling/quantization and short-time signal analysis, the course mainly focuses on all kinds of audio coding algorithms and standards. It aims to train the students to apply the theories and technologies to design and implement the real application programs.

3112102380<Course Design of Digital Content Filtering> Course

Description

Course: Course Design of Digital Content Filtering

Course No.: 3112102380

Credit / Course Hours: 2/48

Preparatory Course: Probability Theory and Mathematical Statistics, C/C++ Programming

Course Description:

With the rapid increase of digital content information in the network, a large amount of useful information is provided, but at the same time a lot of useless and harmful information have also appeared.

These information can bring great adverse social consequences when they are spread online and occupy network resources. Filtering these information has become a new important research topic in the area of content-based information security. The key lies in the analysis and treatment of digital content, and even a certain degree of understanding. To this end, the main content of this experiment is analysis and filtering based on network information content.

Through this course, students are initially set up to acquire, process, analyze and understand the digital contents of the network, to understand and master the basic methods and key technologies of digital content filtering, and to cultivate the practical ability for monitoring and management of digital contents in communication and information networks, and to lay a solid foundation for further research on intelligent management and processing based on information content.

3112102390<Course Design of Multimedia Information Retrieval> Course Description

Course No.: 3112102390

Course: Course Design of Multimedia Information Retrieval

Credit / Course Hours: 2/48

Course Description:

This course uses open source search engine framework as the basic platform and directs students to design a practical multimedia search engine with the knowledge of multimedia document processing and web search technology. The course involves web scraping, essential search engine (inverted index), and multimedia content analysis. Through the course, students will become familiar with the basic concepts and work flow of search engines, and master the use of related open source frameworks, and be prepared for subsequent research of intelligent information processing.

Preparatory Course: None

3112102400<Course Design of Development and Application for Information Recommender System> Course Description

Course: Course Design of Development and Application for Information Recommender System

Course No.: 3112102400

Credit / Course Hours: 2/ 48

Preparatory Course: Probability Theory and Mathematical Statistics, Linear Algebra

Course Description:

This course will provide a comprehensive introduction to the field of Information Recommender System. Specifically, the course will introduce the architectures of information recommender system, evaluation metrics as well as various information recommendation algorithms, including content-based, collaborative filtering-based and deep learning-based algorithms. Through the lectures and projects, students will explore how to practically analyze large-scale personalized data and how to apply related information recommendation algorithms in real world applications.

3112102410<Course Design of Smart Mobile Terminals Development and Application> Course Description

Course: Course Design of Smart Mobile Terminals Development and Application

Course No.: 3112102410

Credit / Course Hours: 2/48

Preparatory Course: C/C++ Programming, Data Structures and Algorithms

Course Description:

This course aims to help students master a popular technology (i.e., J2ME) for the development of smart phone applications, master the basic theory and methods for apps development, and train their abilities of software development and team working through designing and developing a real application. The main teaching content includes: introduction of basic theory and methods for J2ME development, including J2ME introduction, Java programming, UI development, interaction processing, event handling, database operation and networking implementation. Then students select their own development topic, design, develop, debug, and validate in teams. With periodical checks and guidance of the teacher, students will master the basic method of designing and developing a smart phone applications.

3112102420<Course Design of Virtual Instrument and System Development> Course Description

Course: Course Design of Virtual Instrument and System Development

Course No.: 3112102420

Credit / Course Hours: 2/48

Preparatory Course: C/C++ Programming, Data Structures and Algorithms, Design Thinking and Innovation Method

Course Description:

Course Design of Virtual Instrument and System Development, which is the leading course of innovative experiments and relating competitions, requires students to master the methods of graphical system designing and complete simple prototype implementations of virtual instrument systems. This course needs to combine several engineering knowledge and capacities.

This course, launched in the form of programs, lets students face to implements and applications, analyses outstanding problems, and propose integrated designs. The course is aiming to implement system prototypes using several platforms including signal collection, signal processing, embedded development, software design radio, etc. Combining professional knowledge and solving complex engineering problems help the critical knowledge of Electronic Information realize the span from theory to application, and benefit other specialized courses. In this course students will get exercises for the further research and work, and will be prepared for innovation competition and programs based on graphical system designing and virtual instrument platforms.

3112102430<Course Design of Simulation and Planning of Mobile Networks> Course Description

Course: Course Design of Simulation and Planning of Mobile Networks

Course No.: 3112102430

Credit / Course Hours: 2/48

Preparatory Courses: Principles of Communications I, Mobile Communications

Course Description: This course mainly focuses on the simulation and planning of mobile communication networks. The contents of the course cover modeling and simulation of network topology, channel models, traffic models, interference models, key performance indicators, and etc. The experiments of this course include cell site planning, propagation prediction, propagation model calibration, traffic model simulation, interference simulation, KPI collecting, and etc.

3112102440<Course Design of Virtual Reality Development Practice>

Course Description

Course: Course Design of Virtual Reality Development Practice

Course No.: 3112102440

Credit / Course Hours: 2/48

Preparatory Course: C/C++ Programming, Data Structures and Algorithms

Course Description:

This course mainly focuses on the practical training of virtual reality development capabilities. The content of the course covers basic theory of virtual reality, introduction of relative engineering knowledge, development environment of virtual reality system, 3D modeling, human-machine interaction and control technologies, 3D rendering and display methods, etc. Through the study of this course, students can establish the basic concept of the developing a virtual reality system, grasp the design method and development tools and testing process, which lays the foundation for the engineering implementation in the field of electronic information.

3112102480<Innovative Practice> Course Description

Course: Innovative Practice

Course No.: 3112102480

Credit / Course Hours: 2 credits, 48 hours

Preparatory Course: C/C++ Programming, Data Structure and Introduction to Algorithms, Electronic and Circuit Foundation, Digital System Design, Signals and Systems

Course Description:

Innovative Practice is a design-oriented, integrative, and innovative experimental course. It integrates and applies a number of contemporary science and technologies, including: MCU (Microprocessor Control Unit) hardware and software design, Embedded-Processor hardware and software design, Programmable Logic Devices (FPGA / CPLD) hardware and software design, analog integrated circuit design, digital integrated circuit design, mechatronics control, electronic signal measurement, and so on. This course aims at cultivating innovative talents. It emphasizes on training students' ability of problem-analysis and problem-solving, and strengthening students' consciousness of teamwork, and stimulating students' innovative spirit.

3112102490<Discipline Competition> Course Description

Course: Discipline Competition

Course No.: 3112102490

Credit / Course Hours: 2/48

Preparatory Course: Electronic and Circuit Foundation, Digital System Design, Digital Signal Processing, C/C++ Programming design and method, Data Structures and Introduction to algorithms

Course Description: This course aims to cultivate outstanding innovative talents participating in discipline competitions. It focuses on cultivating students' ability of analyzing and solving problems independently, and strengthening students' team awareness, and stimulating students' innovative spirit.

Students are encouraged to participate in world or nationwide discipline competition or comprehensive science and technology competition as well as the college student innovation and entrepreneurship training programs. Students can pass the examination and get credits if they participate in one of various disciplines competition and all kinds of innovation and entrepreneurship competitions recognized by the School of Information and Communication Engineering and obtain corresponding awards.

3112102500<Comprehensive Experiment on Communication Engineering>

Course Description

Course: Comprehensive Experiment on Communication Engineering

Course No.: 3112102500

Credit / Course Hours: 2/48

Preparatory Course: None

Course Description:

This course is a practical course whose basic goal is to try to complete the integration and comprehensive use of the theory and practice knowledge.

This course requires students to work together in a team of about 6-8 people. The basic requirement is that after a team discussion, the objectives of the experiment (project) should be clarified, preliminary research, requirements analysis, program design, equipment selection, cost accounting, schedule management and personnel division should be done in accordance with the project approach and be implemented. Finally submitted software and hardware works and experiment (project) report.

The objective of the experiment (project) may be in the field of information communication or in any direction related thereto, including but not limited to information communication system, information

communication network, information communication terminal, Internet of Things, cloud computing, big data, multimedia and the like. Experiments (projects) must include a combination of hardware and software, but can be based on experimental (project) the target of the software and hardware have focused. Multi-professional students are encouraged to form a team together.

Through this course, the integration of theoretical knowledge and professional skills can be deepened, the process of project establishment, implementation and management of the project can be understood and initially mastered, and engineering practice experience accumulated to improve the engineering quality. Mainly support the electronic information (information and communication) training program graduation requirements of the first 3,4 &10.

The course guidance process requires teachers to work together as a team.

3112102510<Comprehensive Practice on Information Engineering> Course Description

Course: Comprehensive Practice on Information Engineering

Course No.: 3112102510

Credit / Course Hours: 2/48

Preparatory Course: C/C++ Program Designs and Programming Methods, Principles and Applications of Computer, Introduction of Artificial Intelligence/Basis of Data Science

Course Description: This course solves complex engineering problems, which aims to develop the students' comprehensive innovation consciousness, and improve their abilities to solve complex engineering problems. This course takes the form of open topic selection, and adopts the teaching method of flipped classroom supplemented by discussions. It guides the students to plan, design, realize and present one specific project with the combination of the professional knowledge and personal interests. This course can help the students to consolidate their learned knowledge, understand the problems that should be considered during the design of engineering projects, master the process of developing complex engineering problems, be familiar with the modern development tools in the field of information and communication engineering, and improve their skills of teamwork and communication. These abilities lay the foundation for future work in the field of information and communication engineering.

3112102520<Comprehensive Experiment on Electronics and Information Engineering> Course Description

Course: Comprehensive Experiment on Electronics and Information Engineering

Course No.: 3112102520

Credit / Course Hours: 2/48

Preparatory Course: Analog Circuit Theory, Digital System Design, Digital Signal Processing, Principle of Digital Audio Video, Digital Image Processing

Course Description: This course takes the form of open topic selection. It guides the students to select an Electronics and communication design topic and plan, design, realize and present one specific project with the combination of the professional knowledge and personal interests. The topics include but not limited to: Design and implementation of real time video compressing transporting and storage。 Design and implementation of wireless FM stereo signal transporting and decoding. Voice compressing IP terminal Design based on DSP platform。

3112102550<Course Design of Optical Communication Systems> Course Description

Course: Course Design of Optical Communication Systems

Course No.: 3112102550

Credit / Course Hours: 2/48

Preparatory Course: Principles of Communications I, Optical Communication Systems

Course Description: This course mainly focuses on the implementation of a complete design and measurement of a typical optical communication system based on the general concepts, principles and knowledge learned in the “Optical Communication Systems” course. The content of the course covers learning to use the typical equipment for optical communication measurement, learning to measure the performance of optical fiber, laser diode and photo diode, optical amplifier, etc. A complete design process including the scheme survey, system design, software simulation, hardware development, system measurement and report writing should be implemented in this course.

3112190130<Digital Signal Processing Experiment> Course Description

Course: Digital Signal Processing Experiment

Course No.: 3112190130

Credit / Course Hours: 1/24

Preparatory Course: Signals and Systems

Course Description:

Digital Signal Processing Experiment is the supporting course of “Digital Signal Processing”, which supports the teaching of the theory course.

This course aims to provide students with the concept of Matlab platform based theory learning. The ability to solve the experimental problem will be improved and the basic concept of Digital Signal Processing will be understood deeply. This course includes four experiments: Generate the digital signal and plot them; Complete the DTFT and FFT of signals; Realize the design of IIR filter; Realize the design of FIR filters. The verifications of DSP theory based on Matlab and the method of solving practical problems will be introduced.

3112101400<Overview of Communication System> Course Description

Course: Overview of Communication System

Course No.: 3112101400

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: This course is designed for the undergraduate students as a public elective course for quality education. It is a preliminary and introductory course focusing on general concepts and fundamentals of communication system and communication networks, which covers introduction to communication system and communication networks, fundamentals of transmission and networking including transmission media, signal processing, multiplexing methods, modulation and demodulation and switching; typical switching technologies, transmission technologies, various access network technologies based on the fundamentals of transmission and networking; key technologies on public switching telephone network, packet switching network which includes LAN, WAN and internet, as well as technologies on mobile communication networks. Based on the key problems of the communication networks as well as the basic methods to solve these engineering problems, the comprehensive description and schemes on various kinds of communication systems and networks are provided. The methods of analyzing and evaluating communication networks are introduced aiming at training the students' ability of communication engineering thinking. The objective of the course is to present the global view of communication system and networks and lay foundation to systematically study on communication theory and technologies as well as doing communication engineering related work in the future.

3112101410<Comprehensive Design and Application of Electronic Circuit>

Course Description

Course: Comprehensive Design and Application of Electronic Circuit

Course No.: 3112101410

Credit / Course Hours: 2/32

Preparatory Course: Electronic and Circuit Foundation, Digital System Design

Course Description:

The target of the course is to train students' abilities of comprehensive circuits design. Through the course learning, students can master the basic concept and method of hardware system designing. By choosing a practical topic, students can train the team spirit, finish a practical hardware engineering design in lab and submit a course report.

3112101420<Telecommunications Networks System and Applications>

Course Description

Course: Telecommunications Networks System and Applications

CourseNo.: 3112101420

Credit / Course Hours: 2/32

Preparatory Course:None

Course Description: This course mainly focuses on the general concepts, constructions , principles and applications of various telecommunications networks. The content of the course covers typical networks, features and classification of applications, Internet protocols and principles , security analysis and techniques, wireless and mobile networks (1G~5G) and the newest techniques and evolution trends in networks techniques and applications, such as network computing , network and functions virtualization, self-organized network and power networks ,etc.

3112101430<Mobile Multimedia Technologies> Course Description

Course: Mobile Multimedia Technologies

Course No.: 3112101430

Credit / Course Hours: 2 / 32

Preparatory Course: Advanced Mathematics, Probability Theory and Mathematical Statistics

Course Description:

This course focuses on the fundamental technologies used when multimedia information is transmitted in mobile communication systems. The main contents include wireless propagation environment, network architecture and techniques of mobile communication, principles of data collection/compression for audio/video data stream and their transmission process and applications in mobile communication systems, parameters and key factors for performance evaluation. Students will obtain the knowledge of overall architecture and related concepts of mobile multimedia systems; learn about the principles and processes of data collection, compression, transmission, processing and quality control when multimedia information is transmitted in typical mobile communication systems. This course will help students to think problems from the macroscopic aspects of mobile multimedia communication systems and applications.

3112101450<MATLAB and Its Applications> Course Description

Course: MATLAB and Its Applications

Course No.: 3112101450

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: This course mainly focuses on the fundamentals of MATLAB including the numeric operation, symbolic operation, plotting, programming and debugging. The content of the course also covers the applications of MATLAB such as GUI development, Simulink programming, and demos of MATLAB used in communication simulation. It aims to train the students to develop the basic abilities to solve the practical problems in complex mathematic computation as well as general engineering computation and also to lay a basis for further study.

3112101460<Introduction to Mobile Communication Systems> Course Description

Course: Introduction to Mobile Communication Systems

Course No.: 3112101460

Credit / Course Hours: 2/32

Preparatory Course: Advanced Mathematics, College English

Course Description:

Mobile communication has become an important approach in modern society. The course aims at realizing popular science education for mobile communication system related knowledge. The main contents include wireless propagation environment, system design, wireless transmission technology, system performance evaluation. This course will retrospect the history of mobile communication and milestones, introduces main stream standards used nowadays and their key techniques, and discusses the future develop trend of mobile communication. An all-rounded overview of mobile communication techniques will be given in this course, through which the students will improve their abilities to analyze and solve practical problems.

3112101470<New Technologies of Modern Communication> Course

Description

Course: New Technologies of Modern Communication

Course No.: 3112101470

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: This course reflects the evolution of modern communication technologies. It aims to train the students to master the concepts, principles, features and applications of modern communication technologies. This course includes 5 parts. Part 1: introduction of modern communication networks. Part 2: application technologies including communication services and terminals. Part 3: service networks including telephone networks, data networks and Internet. Part 4: transportation and access technologies including optical communication, wireless communication and broadband access. Part 5: converging networks including optical Internet, mobile Internet, next generation broadcasting and TV networks and Internet of Things.

3112101480<Virtual Reality Technology> Course Description

Course: Virtual Reality Technology

Course No.: 3112101480

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: Virtual reality utilizes computer and advanced input/output devices to generate a three-dimensional cyberspace in which users can act freely just as in the daily life with the senses of hearing, sight, touch, smell, and even taste. This course covers the hardware, key technologies, and recent

applications, which enables students to grasp basic concepts, system composition, input devices, output devices, virtual environment creation devices, 3D modeling, development environment and its applications of virtual reality.

3112101520<College Study> Course Description

Course: College Study

Course No.: 3112101520

Credit / Course Hours: 1/16

Preparatory Course: None

Course Description: College study is a course of humanities and social science. It focuses on the investigation of qualities necessary for the academic success of undergraduate students. It aims to solve problems such as undergraduates' unfamiliarity with colleges and majors as well as their inadaptation to the methods of college study, thus helping them understand new life and learning styles, ways of thinking and evaluation methods. This course, taking "college" as the basic concept, and "college study" as the core, illustrates the followings: history of college evolution, regulations, the main parts, teaching methodologies of college teachers, learning methods of college students, evaluation criteria of college education, etc. Moreover, it can guide college students 1) to know about college environment rapidly; 2) adapt themselves to college learning methods; 3) show their interest in what they are learning and enjoy their majors 4) plan a clear career path and finally realize self-development.

3112101600<The Traditional Cultural Appreciation> Course Description

Course: The Traditional Cultural Appreciation

Course No.: 3112101600

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description: This course is oriented to the relevant major of the whole school, supporting the

professional standards and lifelong learning part of the graduation requirements. Through in-depth study of the pre-Qin classics in traditional culture, we can improve history, philosophy, humanities and social science literacy, improve physical health, mental health and professional ethics, enhance our sense of social responsibility, so that look at history from a development perspective to identify positions. Through understanding and practice of practical tools in traditional culture, we can understand the ideas and methods of sages analyzing problems and solving problems, to form self-consciousness, lifelong learning and learning application sense, constantly enhance the ability to adapt to environmental development.

3132101010<Windows NT System Management> Course Description

Course: Windows NT System Management

Course No.: 3132101010

Credit / Course Hours: 2/32

Preparatory Course: Computer Principle and Application

Course Description:

This course is an selective course for information, communication and computer related majors, which does not require the students to have other professional course first.

This course introduce the Windows NT (Windows Severe 2012)network operation system principle, all the network service function configuration and application, through the practice to make the students have the ability to make the configuration and service of Windows Server system. In this course study, the student's research ability, teamwork ability and communication ability are cultivated and improved. This course lay the function for further study other network course.

3132101020<Web Programming> Course Description

Course: Web Programming

Course No.: 3132101020

Credit / Course Hours: 2/32

Preparatory Course: C/C++ Programming

Course Description: Web technologies are widely used in a variety of industries and businesses. A comprehensive presentation is given, including the basic knowledge of Web programming, developing Web applications and deploying Web applications. This course covers Technical overview of the Internet and

web programming, HTML and CSS, JavaScript programming and JQuery components, AJAX engine, Database basics, JSP programming, using of the Dreamweaver and MyEclipse. It aims to train the students to understand the basic ideas and the general methods of Web programming, and apply above knowledge to develop Web application.

3132101030<UNIX Operating System and Applications> Course

Description

Course: UNIX Operating System and Applications

Course No.: 3132101030

Credit / Course Hours: 2/32

Preparatory Course: Computer Principle and Application

Course Description: UNIX operating systems are widely used in a variety of industries and businesses. The course is based on Linux. A comprehensive study is given, including UNIX's evolution, structure, programming environment, and user interface. Topics include the history of UNIX and GNU-Linux, installation, common commands, file system, devices management, user interfaces, the shell, software tools, networking tools, setting up and running servers (DNS, FTP, and Web). Upon completion of this course, students will be able to understand the underlying philosophy of UNIX, manage the computer on which the UNIX running, setting up the programming environments and configure the common servers.

3132101180<Operating System and Software Platform Architecture of

Smart Mobile Phones>Course Description

Course Number : 3132101180

Course : Operating System and Software Platform Architecture of Smart Mobile Phones

Credit(s) : 2/32

Preparatory Course: C/C++ Programming

Course Description :

The operating system (OS) is the key foundation of the development of smart mobile phones

(SMP). The software platform architecture (SPA) has the important influence on the phone's performance, which also should be comprehended by the application developer at the beginning of program design. This course firstly introduces the basic concept of OS of SMP and the main rules for developing the application on the SMP, and then discusses the general software platform architecture for the SMP. After that, the course details the software platform architecture for two common OSs: Android and iOS. The main rules and process of software development on the two OSs are also introduced. The main object of the course is to guide students to understand the SPA and principle of OS and master the basic method of software design and development.

3132101190<Java Network Programming> Course Description

Course : Java Network Programming

Course No. : 3132101190

Credit / Course Hours : 2/32

Preparatory Course: C/C++ Programming

Course Description : Java programming language is specially designed for network programming, and it is also a pure Object-Oriented language. This course focuses on programming practice which covers the basic knowledge of Java programming and network programming including socket, non-blocking network IO, handler for protocol interaction, distributed architecture and Remote Method Invoke. It aims to train the students to understand the basic ideas and the general methods of network programming, and apply above knowledge to develop network application.

3112100431<Idea and Entrepreneurship of Mobile Internet> Course Description

Course: Idea and Entrepreneurship of Mobile Internet

Course No.: 3112100431

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description:

. This course is aimed at the undergraduates. It introduces visual team-building methods, improvisational methods, the concepts and methods of systematic thinking. We draw on brain science theories and creative tools to broaden students' imagination and thinking power. Let students to explore training combining the relevant scenarios of mobile Internet entrepreneurship, such as product design, product operation, entrepreneurial culture and other related business process. We will invite entrepreneurs or industry experts to communicate with students also. This course will enhance the students' creative ability, communication skills, teamwork skills and understanding of the mobile Internet industry and product development process.

3112101510<University Students' Innovative Undertaking> Course

Description

Course: University Students' Innovative Undertaking

Course No.:3112101510

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description:

This course mainly focuses on the knowledge of the University Students' Innovative Undertaking, including the knowledge of the marketing, human resource, financial management, law and regulations. It develops the students' ability of analyzing and solving all kinds of problems in their business. Most importantly, we provide the business resources, including technology resources (such as Internet of Things), marketing resources and so on. The startup of students succeed rates can promote based on the business resources.

3112101530<Principles of Internet Industry and Entrepreneurship>

Course Description

Course: Principles of Internet Industry and Entrepreneurship

Course No.: 3112101530

Credit / Course Hours: 2/32

Preparatory Course: None

Course Description:

This course is an entrepreneurship course for undergraduate students. In this course, students are required

to complete the user research, product design, business model exploration, industrial ecological observation and construction, product trial and error, entrepreneurial culture and other related business process simulation and exploration in a teamwork way. Through improving method, creative situations are built in class. Models related to Internet Entrepreneurship are introduced to students to enhance students' understanding of the Internet industry and the product development process. This course is to stimulate students' interest in the exploration, to create a good communication atmosphere, with fully development of communication ability, teamwork ability, autonomous learning and lifelong learning ability. It enables the students to set up the network view and system view.
