



哈爾濱工程大學
Harbin Engineering University

Information Countermeasure Technique
Academic Program of Undergraduate Education
(2009 edition)



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090803 Information Countermeasure Technology (信息对抗技术专业)

Training Purpose of Specialty: The four-year BA program enables students to possess the basic theoretical knowledge and technical ability of offensive and defensive information warfare technology systems and decision support systems and civil information, security. The students are expected to be advanced engineers and technicians in system design, technical development, operational management, and security in the research institutes, universities, industry and information management department.

Training Requirement of Specialty: This major is to training advanced engineers and technicians for National economy and defense systems. The students mainly study the basic knowledge in various information systems and decision support systems against security technology. With the basic training in system design, technical development, security and operational management, students are expected to possess the basic skills in system analysis and comprehensive integration, engineering and military applications, attack strategy and monitoring and management.

The students must have the following knowledge and abilities:

1. More systematic grasp of the basic theoretical knowledge of Information science, electronic science and computer science disciplines.
2. Master information warfare technology systems and decision support systems and safety analysis and design methods and development techniques.
3. Basic skills of using of computers and equipment to solve engineering problems and initial capacity of research and development of new systems and new technologies.
4. Understand the theoretical front, application prospects and developments of Information warfare and weapons systems Countermeasure field.
5. Master the basic method of the information retrieval, information search, possess certain abilities of scientific research and practical work.

Graduation Standard: The students must finish 180 credits, of which compulsory theory has 109 credits, practice training 49 credits, optional courses 12 credits, General Education elective courses 10 credits.

Key Subject: Information and Communication Engineering, Electronic Science and Technology, Control Science and Engineering, Computer Networks

Main Courses: fundamentals of electronic circuits, digital electronic technology, signals and systems, Microcomputer theory & interface technology, electromagnetic field & wave、digital signal processing, information theory, automatic control principles, the introduction to modern electronic counter measure, radar theory, the foundation of network technology, microwave circuit, information and network security.

Schooling: Quadrennial

Awarding Degree: Bachelor of engineering

信息对抗技术专业人才培养方案指导性计划进程表（一）
Curriculum Of The Major For Information Countermeasure Technique（1）

Curriculum Platform	Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester	
					Theory	Practice		
Fundamental Curriculum Platform	Humanities and Social Sciences	0913123	Ideological and Moral Cultivation and Legal Basic	3	32	16	1	
		0913129	Outline of Chinese Modern History	2	28	4	2	
		0913111	Introduction to Basic Principle of Marxism	3	32	16	3	
		09131(27-28)	Introduction to Mao Zedong Thought and Socialist Theoretical System with Chinese Characteristics	6	56	40	5-6	
		09131(36-39)	Situation and Policy	2	32		2-5	
		09120(01-04)	College English	14	224		1-4	
		0909230	Management B	1.5	24		1	
		0916102	Military Theory	1	36		2	
		09160(01-04)	Physical Culture	4		128	1-4	
	Sub-total Credits				36.5			
	Natural Science and Technology	09110(01-02)	Calculus A	12	188		1-2	
		0911006	ALinear Algebra and Analytic Geometry A	4.5	64	8	1	
		0911008	Probability and Statistics	4	64		2	
		0911009	Complex Function and Integral Transformation	3	48		3	
		09110(12-13)	College Physics A	8	128		2-3	
		0910709	General Chemistry	2.5	32	8	1	
		0906001	Fundamentals of College Computer A	1	16		1	
		0906011	Programming Foundation (C language)	3	32	16	2	
		0907011	Fundamentals of Engineering Graphics	2.5	40		3	
		0902401	Basic mechanics	3	48		3	
		0908001	Fundamentals of Electric and Electronic Engineering	4	56	8	3	
	0907021	Fundamentals of Machinery	3	46	2	3		
	Sub-total Credits				50.5			
	Practice	0916101	Military Training	3		3weeks	1	
		0917101	Engineering Knowledge	1		1week	2	
		09110(17-18)	Physics Experiment of College	4.5	4	68	2-3	
		0917201	Engineering Practice A	4		4weeks	4	
	Sub-total Credits				12.5			
	Optional Courses for General Education				10	10 credits at least		
	Total				109.5			

信息对抗技术专业人才培养方案指导性计划进程表（二）
Curriculum Of The Major For Information Countermeasure Technique（2）

Curriculum Platform	Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester	
					Theory	Practice		
Specialized Curriculum Platform	Specialized Fundamental Courses	0908003	Digital Electronic Technology	3.5	56		5	
		0908005	Fundamental of Electronic Circuits	4.5	72		4	
		0908006	Signals and Systems	4	64		4	
		0908007	Electromagnetic Field and Electromagnetic Wave	3	48		4	
		0908008	Microcomputer Theory & Interface Technology	2.5	40		5	
	Specialized Key Courses	0908009	Digital Signal Processing	2.5	40		5	
		0908010	Analysis of Stochastic Signals	3	48		6	
		0908012	Theories of Communication B	3	40	8	6	
		0908014	Automatic Control Principles	2.5	40		5	
		0908015	Information Theory	2	32		5	
		0908016	Introduction to Modern Electronic Counter Measure	4	54	10	7	
	Specialized Practice	09081(01-02)	Electronic Technology Fundamental Experiment	1		32	4-5	
		09081(03-04)	High Frequency Electronic Circuit Experiments	1		32	5-6	
		0908023	Experiment of Electronic Circuits	1		32	6	
		0908024	Experiments of Signal Processing	1		24	5	
		0908025	Microcomputer Experiments	1		24	5	
		0908027	C Programming Design	1		32	7	
		0908028	Electronic System Design(SCM)(MCU、FPGA)	1		32	6	
		0908029	Specialty Comprehensive Experiment	1		32	7	
		0908030	Graduation Practice	2		2weeks	7	
		0908031	Graduation Design	14		14weeks	8	
	Optional Courses				12	12 Credits at least		
	Sub-total Credits				70.5			
	Total				180			

信息对抗技术专业选修课设置一览表
Optional Courses of the Major of Information Countermeasure Technique

Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester
				Theory	Practice	
Specialized Optional Courses	0908032	Radar Theory	2	32	8	6
	0908069	The Foundation of Network Technology	2	30	2	5
	0908070	Information and network security	2	32		6
	0908071	Microwave Circuit	2	32		6
	0908013	Microwave technology	2.5	40		5
	0908033	Antenna Technique	2	32		6
	0908036	Image Processing	2	26	6	6
	0908039	DSP Principle & Application	2.5	16	32	6
	0908043	English for Special Science and Technology	2	32		5
	0908045	Information Hiding Technology	2	24	8	8
	0908051	Radar Signal Processing	2	32		7
	0908072	Digital Receiver Technology	2	32		7
	0908073	MATLAB Language and Application	2	16	16	7
	0908074	Guidance Technology	2	32		8
	0908075	Introduction of Target Detection Technology	2	32		6
	0908076	Vector Signal Analysis and Measurement	2	28	4	7
	0908077	Game Theory	2	32		6
	0908078	Data Structure	2	32		6
		Sub-total Credits		37		

Course	Engineering Practice A		
Course No.	0917201	Semester-open	4
Total Hours	4weeks	Total Credits	4
Brief Introduction to Course			
<p>This course is opened to sophomores and juniors. It has different mandatory and optional teaching units according to different majors such as science and arts. Through the courses-selected system, “reserve teaching” can be achieved. Students are instructed about basic mechanical techniques and operate skills in order to improve their ability of engineering practice. This course includes traditional processing technology training such as lathe, pliers and milling, modern manufacturing technology training such as CNC technology and special machining as well as other basic skills training. The units of “process design” and “innovative manufacturing” are set up to encourage students to exert imagination to complete a work based on basic skills and various manufacturing methods.</p>			

Course	Engineering Knowledge		
Course No.	0917101	Semester-open	2
Total Hours	1week	Total Credits	1
Brief Introduction to Course			
<p>This course is opened to all freshmen with the “distributed teaching” form. The course aims to popularize basic engineering knowledge and concepts and arouse students’ interest and curiosity. The course includes several units, such as mechanical structure, control technology, manufacturing technology, engineering management, mechatronics and engineering materials. By means of certain system, various models and other teaching instruments, students are allowed to practice and be acquainted with various technical fields in modern engineering with active thinking.</p> <p>This course equips students with some basic knowledge and a general outline of the engineering field. Students have access to get a preliminary understanding of materials used in engineering, mechanical structure, control methods, manufacturing methods, engineering management rules as well as the basic concept in engineering: safety, environmental protection, quality, cost, management and economy. This course spreads engineering knowledge and inspires students’ curiosity and interest to further study science and technology, exploring the mysteries in engineering.</p>			

Course	Military Theory		
Course No.	0916102	Semester-open	2
Total Hours	36	Total Credits	1

Brief Introduction to Course

The main thread of this course is national defense education. Through the course of military theory, students are instructed to comprehend basic military theory and military skills, enhance awareness of national defense and national security, strengthen the concepts of patriotism and collectivism, improve the sense of organization and discipline and increase comprehensive quality. This course also lays the foundation for reserve forces of People's Liberation Army and China's future socialist builders.

This course is given in the fall semester each year and its form is classroom teaching.

Course	Military Training		
Course No.	0916101	Semester-open	1
Total Hours	3weeks	Total Credits	3
Brief Introduction to Course			
<p>The main thread of this course is the national defense education. The military training course instructs students to comprehend basic military theory and military skills, enhance awareness of national defense and national security, strengthen the concepts of patriotism and collectivism, improve the sense of organization and discipline and increase comprehensive quality. This course also lays the foundation for reserve forces of People’s Liberation Army and China’s future socialist builders.</p> <p>This course is given at the beginning of the fall semester of each year and its form is group training on the campus.</p>			

Course	Outline of Chinese Modern History		
Course No.	0913129	Semester-open	2
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>Course purpose Since modern times, this course mainly teaches Chinese to resist foreign aggression and struggle for national independence, to overthrow the reactionary rule, realize the history of the people's liberation. To help students know national history and national conditions, understand the history and how the people chose Marxism, chose the leadership of the communist party of China, has chosen the socialist road. Understanding under the leadership of the communist party of China the great importance of reform, opening up and modernization construction, firm the confidence of the road of socialism with Chinese characteristics.</p> <p>This course is require students to master the development of China's modern history context, consciously inherit and carries forward the patriotic tradition; further strengthen national self-esteem, self-confidence and pride. Through the analysis of the related history, events and characters, to improve the scientific view of history and methodology to analyze and evaluate the historical problems, ability to distinguish is history and social development direction.</p>			

Course	Ideological and Moral Cultivation and Legal Basic		
Course No.	0913123	Semester-open	1
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Integrated use of the basic stand, and viewpoint and method of Marxism, in the correct outlook on life, values, moral and legal education is the basic content, on the combination of theory with practice, and concerned with the practical problems to be faced to the contemporary college students scientific persuasive answer, to help college students firmly establish a "eight honors, eight disgraces" as main content of the socialism outlook for honor and dishonor, to cultivate good ideological and moral qualities and legal quality, to grow for the all-round development of qualified builders and reliable successors to the cause of socialism, and to lay a solid ideological and moral cultivation and legal culture foundation.</p> <p>By learning this course, the college students can be outlook on life, values, ethics, legal education, students learn to deal with individual and society, individual and nature, the relationship between individuals and legal persons, individual and country, to help college students to grow and thrive.</p>			

Course	Introduction to Basic Principle of Marxism		
Course No.	0913111	Semester-open	3
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Course purpose This course through the student to carry on the system of Marxism theory education, to make the students master the basic ideas of dialectical materialism and historical materialism, to sets up the correct world outlook, to outlook on life and values, to cultivate and to improve students' Marxist theory analysis and the solution actual problem ability, it is help students to correctly understand the basic law of social development, the correct understanding of capitalism and socialism in the process of the development of various new situations and new problems, the understanding of socialism replacing capitalism the historical inevitability, the firm faith of socialism and communism.</p> <p>Teaching basic requirements To help students on the whole grasp of Marxism, to correct understanding the basic law of social development. student can carry on the basic principle of Marxism education, and students to master the scientific world outlook and methodology of Marxism, to sets up the Marxism world outlook, the outlook on life and values, to learn to use the Marxist stand, viewpoint and method of question analysis, students can establish socialism and communism ideal and faith, consciously adhere to the party's basic theory, basic line, basic program and basic experience, and do the qualified builders and reliable successors of socialism, and lay a solid ideological and theoretical basis.</p>			

Course	Complex Function and Integral Transformation		
Course No.	0911009	Semester-open	3
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Complex Function and Integral Transformation (CFIT) is a basic course for majors in Engineering and applied science. By learning this course, students can initially grasp the basic theory and methods of complex function, the theory and methods of conformal mapping and the characteristics and applications of the Fourier transform and the Lapalme transform. The course will provide the necessary mathematical foundation for students to learn the related professional courses and for future practical application.</p> <p>To grasp a variety of representations and the operations of the complex numbers; To know the concepts of point sets and regions; To understand the concepts of the complex function, and to know the concepts of limit and continuity of the complex function.</p> <p>To understand the concepts of the derivative of the complex function and to know how to derive it; To understand the concepts of analytic function, to grasp how to judge the analyticity of Cauchy-Riemann conditions, and to know the basic properties of certain elementary analytic function; To know the relationship between harmonic functions and analytic functions, and to grasp the methods of finding imaginary (real) part of the analytical functions from its real (imaginary) part.</p> <p>To understand the definitions and properties of integral, and to know how to solve the integral of the complex function; To grasp the Cauchy theorem, and know how to calculate definite integral by using Cauchy theorem and composite closed theorem; To grasp the Cauchy integral formula and higher derivative formula in order to calculate integrals.</p> <p>To know the geometric meaning of the derivative and the concepts of the conformal mapping; To grasp the mapping properties of fractional linear mapping such as the property of preserving round and symmetry; To know the mapping properties of the power functions and the exponential functions. To know how to find the conformal mapping between certain simple areas like the half-plane, the angular domain, a circular domain and the strip domains.</p>			

Course	Probability and Statistics		
Course No.	0911008	Semester-open	2
Total Hours	64	Total Credits	4
Brief Introduction to Course			
<p>Probability and Statistics (PS) is a mathematical course, which studies the objective laws of the stochastic phenomena. It is one of important basic courses in teaching programs in colleges and universities. With the development of science and technology and the people's needs to understand the laws of the stochastic phenomena, the methods in Probability and Statistics (PS) are now increasingly penetrating into many areas of the natural sciences and the social sciences. By learning this course, students will grasp the basic concepts of Probability and Statistics (PS), will learn the basic theory and calculation method of the probability, and will grasp the more commonly used statistical inference methods. Then it will help students cultivate the ability of dealing with stochastic phenomena by the basic ideas and methods, and develop the ability of solving practical problems with the thinking methods of probability and the tool of statistics.</p>			

Course	Linear Algebra and Analytic Geometry A		
Course No.	0911006	Semester-open	1
Total Hours	72	Total Credits	4.5
Brief Introduction to Course			
<p>Linear Algebra and Analytical Geometry (LAAG) is a mathematical course which is not only highly applicable in applications but also extremely abstract in theory. It is a compulsory course for students who major in science, engineering, economy and management. The basic concepts, methods and theories of this course are the required preliminary knowledge for students to study the follow-up course further. By teaching the contents such as space analytical geometry, system of linear equations, matrix, liberalized space and linear transformations, teachers will help the students grasp the theory and related basic knowledge, including the common methods of matrix, system of linear equations, quadratic form, liberalized space and the linear transformations. This will be helpful for students to grasp the matrix calculation abilities and the practical problem-solving abilities. In particular, by combining the methods of algebra and geometry, students can gain the abilities of abstract thinking and calculations gradually from the lower orders to higher orders. By setting up the experimental teaching links, teachers can help students cultivate the abilities of both the scientific computations and the practical applications. By studying this course, students will be capable of grasping the basic concepts, methods and theories of linear algebra, which will be helpful for them to cultivate the abilities of abstract thinking, spatial imaginations, logistic derivations, scientific computations, mathematical modeling and practical problem-solving.</p>			

Course	General Chemistry		
Course No.	0910709	Semester-open	1
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>General chemistry is one of the basic courses of science and engineering. By learning the basic law of the chemical reaction and the structure of matter, students are able to understand the basic theory of modern chemistry, the framework of chemistry, and use chemical theory, viewpoint and method to examine the social hot spots of public concern such as environmental pollution, energy crisis, as well as new engineering materials problem. Through the study of general chemistry, the students will grasp the basic theory, knowledge and basic of chemistry, which will enable students to complete the transition of learning methods and ways of thinking from school to university. This will develop their basic analysis of issues and problem-solving skills, which lay a chemical basis for the follow-up courses. General chemistry experimental course is an important part of the general chemistry course. It is a very important part to prepare students for wide range of abilities, such as independent operation, observation, record, analysis and generalization, report writing and so on. Experiments enable students to better understand and master the basic principles and knowledge of the general chemistry, and to develop students independent thinking, comprehensive ability to use knowledge, so that students get a comprehensive chemical quality of education.</p>			

Course	Management B		
Course No.	0909230	Semester-open	1
Total Hours	24	Total Credits	1.5
Brief Introduction to Course			
<p>Through this course, students will master numerous scientific theories of management, know the main contents of modern management and get familiar with the basic functions of management, for example, functions of management, organization, motivation and control; and achieve the aim of guiding product research and development, technical innovation and project management with the ideas of management, and finally gain the indispensable methods and ideas required for long-term study and development in future.</p>			

Course	Graduation Design		
Course No.	0908031	Semester-open	8
Total Hours	14 weeks	Total Credits	14
Brief Introduction to Course			
<p>All students are required to complete a graduation project as part of their graduation requirements. The purpose of the graduation project is to provide students with an opportunity to engage in an activity that will allow them to demonstrate their ability to apply the knowledge and skills they have gained throughout their years in the educational system. The project is designed to ensure that students are able to apply, analyze, synthesize, and evaluate information and to communicate significant knowledge and understanding.</p> <p>Basic requirements of graduation project:</p> <ol style="list-style-type: none"> 1. Students are required to make investigations, collect data, compare alternative schemes and cultivate abilities of logical analysis, designing and calculating, computer skills, graphing of engineering and thesis drafting. 2. Students should fulfill assignments independently with the guideline of teachers. 3. The thesis should include account and calculating related to the design. Content integrity, accurate calculating, conciseness and fluency of the account, as well as a neat binding should be guaranteed. 4. Design drawings should tell clearly the designing purpose while achieving a reasonable layout. It should be written in technical lettering. and meet the standard of engineering drawing. 			

Course	Graduation Practice		
Course No.	090830	Semester-open	7
Total Hours	2 weeks	Total Credits	2
Brief Introduction to Course			
<p>Through the graduation practice, it will enhance students' understanding of the professional knowledge. By developing embedded system and practicing in communication system, the students are required to understand the industry standard, project development, production, and improve the ability of engineering practice, which will prepare for graduation design. This course is mainly completed in Neusoft and ZTE, and finally students submit the relevant learning summary report.</p>			

Course	Specialty Comprehensive Experiment		
Course No.	0908029	Semester-open	7
Total Hours	32	Total Credits	1
Brief Introduction to Course			
<p>Specialty comprehensive experiment is a comprehensively experimental course, which is located after the theoretical course and the related experimental training, and before the undergraduate graduation design. Its purpose is to improve the practical ability and system development capabilities, and make a foundation for the graduation project. The experiment is to strengthen innovative practice ability. The students' scientific and technological innovation is included in the necessary training program in order to institutionalize complete the student technological innovation ability training.</p> <p>In the comprehensive experiment, the students are required to make a team with 2-4 students, and find an experimental project by themselves in the first three weeks of the 7th semester. After the opening report, the students independently finish the experimental content. At the end of the seventh semester, The score is given by examination committee after the report is completed.</p> <p>Specific test requirements: this experiment requires the application of two or more knowledge units to design a certain electronic information system. The project must be related to the topics in different major. The project should be with clear objectives, clear design ideas, integrated design results (with system-level debugging and testing), and the report should be complete.</p>			

Course	Electronic System Design(SCM)(MCU、 FPGA)		
Course No.	0908028	Semester-open	6
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>This experiment is an important part of the system of electronic courses, is an important practical course, its purpose is to enable students to master the basic skills of single basic composition and its working principle and application of SCM system design, grasp the construction and use of microcomputer application system, master the programming method, MCU debugging method, design and through the use of integrated electronic system, improve the students' ability of integrated electronic system design. This study also provides the necessary knowledge and talent selection for graduation design, electronic competition, but also for the students after graduation to work in the MCU application design to provide the knowledge reserve.</p> <p>This is an practical course mainly for senior students of electrical department which includes Electronic and Information Engineering, Communication Engineering, Information Confrontation, and Microelectronics. Through the course of digital circuit theory and experiments, students can use QuartusII skillfully to do the system design and development for FPGA and CPLD. This course takes the main courses(such as Communication Theory, Digital Signal Processing, Images Process, Principles of Radar and so on) as the theory support, students can fully understand and grasp the principles and methods involved in the related courses by practicing and learning in this course, and apply them to the design of electronic systems, thus we can improve the students' ability of integrated electronic system design. This experiment also provide necessary knowledge and talents for graduation design and electronic contests.</p>			

Course	C Programming Design		
Course No.	0908027	Semester-open	7
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>The main teaching goal is to enhance the programming skill of students. Former courses have provided students with a solid foundation in C programming, and this course follows on to build up their programming maturity and expand breadth and depth of experience. This course will work from the C programming language up to the Visual C++ programming language. With a complete understanding of how computer system execute programs and manipulate data, students will become a more effective programmer, especially in dealing with issues of debugging, performance, and robustness. Topics covered include: the C programming language, Visual C++, Win32 API programming, and projects of communication and signal processing.</p>			

Course	Microcomputer Principle and Interface Technology Experiments		
Course No.	0908025	Semester-open	5
Total Hours	24	Total Credits	1.5
Brief Introduction to Course			
<p>“Microcomputer Principle and Interface Technology Experiments” is the supporting experimental class to the Microcomputer Principle and Interface Technology courses. This lab class is intended to train the students on both assembly language programming and hardware interface design.</p> <p>The course requires students to master computer architecture components, interfacing technology, and its programming design method; Based on mastering the basic principle and method, students can learn to analyze and solve problems through active learning and application of knowledge; develop students' knowledge application ability and ability to innovate.</p> <p>The microcomputer experimental part of the basic requirements:</p> <ol style="list-style-type: none"> 1. Master architecture and principle of CPU and basic interface. 2. Master Programming in x86 assembly language and Debug tool of assembler language 3. Master the organization/operation of memory 4. Master the property of primary interface chip and typical application method 5. Master the method of hardware system analysis and design, through an assignment of small-sized curricular project design 			

Course	Experiments of Signal Processing		
Course No.	0908024	Semester-open	5
Total Hours	24	Total Credits	1
Brief Introduction to Course			
<p>In accordance with the training Standards and training objectives of our school, from the perspective of professional knowledge and professional skills, cultivate students' ability of using computer numerical tools for theoretical simulation, analysis and calculation is an important part of cultivate students' practical ability, it is also an important part of build the undergraduate training system of our college.</p> <p>This course is based on "Signals and Systems" and "Digital Signal Processing", take the theoretical content of these two courses as the background, its goal is to train the student ability of theoretical simulation and model analysis.</p> <p>The experiment environment is MATLAB language, the experiment principle is signal processing theory, the environment subjects is signal analysis and system design, the experiment way is the program, the experiment results is numerical calculation and graphical demonstrate, the main environment methods are case study, simulation and summarize, the final test is experiment report.</p> <p>Combine the signal processing theory and computer experiment in order to help students understand the principles of signal processing better, to experience the excitement of using the abstract mathematical concepts to practical signal processing, it has important significance to improve students' interest in learning and improve students' studying ability, to cultivate the students' awareness of innovation.</p> <p>Mathematics is the main tool of Signal processing disciplines; this course has the characteristics of mathematical experiment on considerable extent. The goal of this experiment course is not only make the students learn to use mathematical software, but also cultivate the student's ability of analysis problems, solve practical problems by using computer tools and discovering problems, ask questions in practice in accordance with theoretical knowledge of signal processing. In this course combine the characteristics of research, cultivate the student's ability of acquire knowledge, solving problem. By different levels of experiment subjects such as skills-based, integrated design and research, improve students' comprehensive ability, system design capabilities, engineering practice and innovative ability.</p>			

Course	Electronic Circuit Synthesis Experiment		
Course No.	0908023	Semester-open	6
Total Hours	32	Total Credits	1
Brief Introduction to Course			
<p>The aim of the course Electronic Circuit Synthesis Experiment is to train students to master the basic skills of Electronics Engineering and the basic methods of integrated design of electronic circuit system. Let the students to be familiar with the modern electronic circuit structure and working principle, then have the ability to design the system independently, and have the ability to analyse and solve independently the problem during implementing the system, through the course students can acquire the knowledge of Synthesis experiment skills about signal processing, signal detection and signal transmission and the programmable devices application and MCU program. The course also can cultivate professional interest and practical ability of students, provide the chance for students to better adapt to the job requirements.</p> <p>1, Train students the ability to comprehensively apply the basic electrical knowledge to design, assemble, test and summary the actual electronic circuit device, enhance the ability of students to use the knowledge to solve practical problems, by supporting the cohesion and basic experimental course, complete the integration of design students ability to achieve the advanced electronic circuit system culture.</p> <p>2, During the experimental teaching of this course, students can master the basic principles and methods of electronic circuit system design, and implementation method of engineering design process.</p> <p>3, Train the students to use the basic software and hardware circuit design to design, construct and complete the practical electronic circuit system circuit.</p> <p>4, The course and other courses complement each other, this can cultivate the ability of electronic circuit system design and innovation of students, training students to adapt the needs of the twenty-first Century economic development the application of electronic design talent.</p> <p>5, Cultivate and improve students' scientific quality, engineering consciousness and the spirit of innovation.</p> <p>Electronic Circuit Synthesis Experiment lay emphasis on practice, students are required to complete the design task independent design, independent practice and engineering, the course is a practical course. The basic teaching requirements for:</p>			

1, The course is to cultivate students' scientific attitude, innovation spirit and practice ability, pay attention to the hardware module design and software programming of comprehensive design ability.

2, The course involves students wide knowledge, comprehensive and flexible in the application of knowledge, curriculum to the actual operation, experimental project system level the student independent design comprehensive.

3, Ask students to grasp the basic process of electronic design and methods, to master the design method of the basic unit, and then use the module to realize electronic system design, basic debugging methods and testing index.

4, Requires that the student is able to access to a large number of Chinese and English data, access to electronic device manual and query electronic devices relevant information on the Internet, puts forward the design scheme, completed the design task.

Course	Introduction to Modern Information Countermeasure		
Course No.	0908016	Semester-open	7
Total Hours	64	Total Credits	4
Brief Introduction to Course			
<p>Modern Information Countermeasure is a soaring technology in multi-discipline and their cross use. The Introduction to Modern Electronic Countermeasure is a specialty course of our college for seniors. We construct it according to discipline characters, social requirements and school situations. Cultivate targets of the specialty course is identified.</p> <p>Base on the scholarly level and the advanced techniques of our college and take fast developing of military information and weapon information as an opportunity, we construct the course with modern passive radar techniques as core theory teaching content and recent research experiments results as the teaching experiments. Aims at training creative talents for information countermeasure</p> <p>After the course, the students in information Counter Measure will be aware of the system knowledge of information Countermeasure, which include the basic knowledge of the definition, connotation for information warfare and the present and development tendency of the subject in the world. And be familiar with definition, connotation, content, architecture and key techniques of Network - Centric Warfare, the main mode of modern information warfare. The contents of course to be studied are the principle, theory and technical measure of computer Countermeasure, Electronic Countermeasure and Command & control Countermeasure. The main points of course are the detection and estimation of parameters for passive radar system, which include sort & recognition of radiation sources and direction-finding & location of the sources. By the study of the course, the students will grasp the knowledge of how to design a passive radar system and how to realize a system with hardware and software.</p>			

Course	Information Theory		
Course No.	0908015	Semester-open	3
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>Nowadays information industry is developing rapidly, which requires a large number of engineers major in information, communications and electronic engineering, and the course of "Information Theory " is the foundation course of such profession . The core of this course is Shannon's information theory, Shannon is the first one to have mathematical theory applied to communication technologies, and set up information theory. Shannon find theoretical guidance for communication technology and make it a branch of science. Shannon gives out the concept of information, formulas for measurement to transform the way of information analyzing from qualitative into quantitative. On this basis, we can compare the advantages and disadvantages of various information processing methods in order to conduct deeper research of information technology. The theory of information is the mathematical basis of information and communication technologies.</p> <p>The theory of information not only solves the problem of communication's effectiveness and reliability in methodological level, but also helps recognizing the nature of things in the level of epistemological. As long as there is a place for information transmission, it is can be guided with information theory, and it relate to daily life, work and study. Learning through this course, students will be able to master the basic theory of information theory, coding theory and implementation principles, understand the entropy of information source, properties of entropy, lossless source coding theory and rate-distortion source coding theory, several frequently-used methods of source coding, channel capacity and channel coding. By studying these contents, you can see that the mathematical theory plays an important role in communication technology and information processing; also you can see the binding process of mathematical theory and these techniques and engineering problems.</p> <p>Through this course, students are required to master the basic theory and concepts of information theory, such as entropy, mutual information, self-information amount and so on; master the definition of information, statistical measures and discrete information source in the angle of information theory; master theories of information related to discrete channel and methods of source coding, such as Shannon-Fano coding method, Huffman coding and other basic principles and specific methods of implementation; master theorem of noise channel coding; master basic principles of information's rate-distortion and lay a solid foundation for further study.</p>			

Course	Automatic Control Principles		
Course No.	0908014	Semester-open	5
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>With the rapid development of electronics, information, communication network technology and specialty and multi-discipline interpenetration, students engaging in electronic and information specialty must meet with future requirements including mastering information and network technology as a means, computer technology as the core of the modern intelligent network control system, control theory as the foundation of theory. In this course it will be taught that the basic theory, basic analysis methods and design methods of automatic control system. It is a strong theoretical engineering discipline.</p> <p>This course focuses on improving abilities of proposing questions, analyzing problems, solving problems. It is required that students can master the basic principles of the feedback control, the classical control theory, the time domain analysis and the frequency domain analysis for the linear time invariant system, the basic methods and design principles in the frequency domain and time domain design and compensation. Through this course students can understand preliminary modeling of the automatic control system. Meanwhile, they can analyze and design automatic control systems for classical models and lay a solid foundation for further study on control system design and analysis. The outlook of this course is as follows.</p> <ol style="list-style-type: none"> (1) the basic concepts of automatic control. (2) the mathematical model of the control system. (3) time domain analysis of automatic control system. (4) root locus analysis of automatic control system. (5) frequency domain analysis of automatic control system. (6) classic theory of control system compensation. 			

Course	Theories of Communication B		
Course No.	0908012	Semester-open	6
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>System level cognitive communication system and important performance index; master the basic theory of communication and the basic concept; to cultivate the ability of modeling and performance analysis of communication system with the communication system of independent design ability.</p> <p>The basic concept, teaching communication system the basic principle and main function unit; teaching communication system function unit (subsystem) to construct mathematical model, and the application of mathematical model for performance analysis; application of the theory of course content, according to the actual demand, the design of communication system, and verify.</p>			

Course	Analysis of Stochastic Signals		
Course No.	0908010	Semester-open	6
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>This course helps students to grasp the basic concepts and statistical characteristics of random variables and random processes, including stationary and ergodic processes, Gaussian Process and white noise process. It will also discuss the response of LTI or nonlinear systems to stationary random input signals, the sample theorem and random sequence model. This course will help students to set a solid foundation for future study and research in their major area.</p> <p>Upon successful completion of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Master the basic concepts of probability space and random variable. Master the definitions of probability density function and characteristic function. Compute the numerical characteristics of random variables. Understand limit theorem and converge of random sequences. 2. Master the definition of a random process. Analyze and characterize random processes in terms of probability density functions, and first and second order statistics. Master the stationary (both strict-sense and wide-sense) and ergodic. Compute the autocorrelation and numerical characteristics of a stationary random process. Master the concepts and properties of Gaussian process. 3. Master the definitions and properties of the power spectral density and Cross-spectral density functions. Understand rational spectrum decomposition theorem. Master the definition and properties of white noise process. 4. Analyze and compute the response of LTI systems to stationary random input signals in time domain and frequency domain. Master the definition of equivalent noise bandwidth. Understand the important conclusions about the response of nonlinear systems to random input signals. 5. Understand the sample theorem of random process, the definition and models of random sequence, the design of whitening filter. Analyze the response of discrete-time linear system to random input sequence. 			

Course	Digital Signal Processing		
Course No.	0908009	Semester-open	5
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>"Digital Signal Processing" is an important professional foundation course of communication and electronic information Specialty for engineering colleges; it is mainly opened in the Specialty of Electronic Information Engineering, Communication Engineering, Information Warfare Technology, microelectronics. The course introduces the basic theories of discrete-time signal and system analysis, principles and fundamental analysis, implementation methods, the basic principles of digital filter design methods and so on.</p> <p>Through the study of this course, students will master the analysis of discrete-time signals and systems in time domain, in frequency domain and Z transform, discrete Fourier transform and its fast algorithm, the basic structure of the digital filter, IIR and FIR digital filters design theory and design methods, the basic implementation of digital signal processing methods, Multiple sampling rate signal processing. Lay the good foundation for students' follow study of professional courses such as signal detection, digital image processing, communication principle, speech signal processing and DSP principle, and also Lay the good foundation for the further study of modern digital signal processing theory and implementation techniques, to improve the students' ability of analysis solve practical problems.</p> <p>Basic teaching requirements:</p> <ol style="list-style-type: none"> 1. Master signal sampling process and the changes of spectrum, master discrete-time systems and Z-transform, and acquire the basic skills of analysis discrete-time signals and systems. 2. Master the definition and nature of Discrete Fourier Transform, master circular convolution and the basic principles of frequency sampling, master the time extraction and frequency extraction of base-2 fast Fourier transform methods, understand the inverse fast Fourier transform method. Understand the linear frequency modulation Chirp z-transform method. 3. Master the type and structure of digital filter. 4. Familiar with the characteristics and design methods of commonly used analog low-pass filter, understand the characteristics of infinite impulse response (IIR) filter, master the design methods of IIR filter, such as impulse response method and the bilinear 			

transformation method and prototype transformation method.

5. Understand the characteristics of finite impulse response (FIR) filter, master the design methods of FIR filter, such as window method and the frequency sampling method.

6. Can analyze multiple sampling rate system, describe the application of sampling techniques in A / D, D / A converter, and describe the relationship between every level of signals in the quadrature mirror filters, understand the basis knowledge of the hardware implement to digital signal processing.

Course	Microcomputer Principle and Interface Technology		
Course No.	0908008	Semester-open	5
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>"Microcomputer Principle and Interface Technology" is a core professional course of electronic information foundation classes. The main purpose of this course is to enable students to completely understand the structure of computer hardware system and working principle as well as the peripheral applications and design methods to help students to develop the ability in analysis of the structure of computer hardware, application, design and development and master the basic skills of computer applications.</p> <p>The content of this course includes internal architecture and basic mechanism of CPU, instruction system and assembler language, external architecture of CPU, memory architecture, general interface architecture and operation mechanism, 8251 programmable peripheral interface , 8255 programmable peripheral interface, 8253 timer controller, 8259 programmable interrupt controller. Debug tool of assembler language based program is also introduced.</p> <p>After learning student would have a good grasp of the basic theory of microcomputer and interface, the operation of basic computer hardware components; describe how data is stored and manipulated in a computer; program in x86 assembly language; and be able to practice them in application development;</p>			

Course	Electromagnetic field and electromagnetic wave		
Course No.	08010070	Semester-open	4
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Electromagnetic field and electromagnetic wave an important basic course of electronics and telecommunication. It is a the necessary foundation for following application course , such as Electromagnetic radiation, Electromagnetic compatibility , antenna systems and microwave technique, which are all the applied technique of electronics.</p> <p>Starts with vector analysis and field theory, the key mathematics tool for Electromagnetic. We introduce definition and calculation of gradient divergence and curl. Application the mathematics knowledge of field theory, we illustrate three basic steady Electromagnetic field, electro static fields, Constant flow field and steady magnetic field. After grasping the analysis methods of the steady fields. The Time-varying filed and Maxwell's equations are discussed. Maxwell equation is the most important content of the course for these equations form the basis of all electromagnetic theory. They are partial differential equations and relate the electric and magnetic fields to each other and to their sources, charge and current density,. At last but at least, electromagnetic wave is introduced as the primary application of electromagnetic theory, in which we focuses on the uniform plane wave. It is include some content of wave propagation in single medium, Pynting vector, wave polarization and wave reflection from multiple interfaces, etc. The experiments of the course are demonstration experiments, which include measure the wavelength of electromagnetic wave, validate Snell's law and Electromagnetic wave polarization phenomenon, etc.</p>			

Course	Signals and Systems		
Course No.	0908006	Semester-open	4
Total Hours	64	Total Credits	4
Brief Introduction to Course			
<p>The concepts of signals and systems arise in a wide variety of fields, and the ideas and techniques associated with these concepts play an important role in diverse areas of science and technology. The course is frequently found in electrical engineering curricula, the concepts and techniques that form the core of the subject are of fundamental importance in all engineering disciplines. In fact, the scope of potential and actual applications of the methods of signal and system analysis continues to expand as engineers are confronted with new challenges involving the synthesis or analysis of complex processes. For these reasons the course not only is an essential element in an engineering program but also can be one of the most rewarding, exciting, and useful courses that engineering students take during their undergraduate education.</p> <p>The basic requirements for teaching</p> <ol style="list-style-type: none"> 1. Clearly understand the basic concepts of signals and systems. 2. Familiar with the basic content and procedures of the analysis of signals and systems; understand the function and applications of the methods. 3. Have equal familiarity with techniques suitable for analyzing and synthesizing both continuous-time and discrete-time signals and systems. 4. Have a firm grounding in the use of computers for the analysis of signals and the implementation of systems. 5. Have ability of further study and application of analyzing and synthesizing methods and theoretical of signals and systems. 			

Course	Fundamental of Electronic Circuits		
Course No.	0908005	Semester-open	4
Total Hours	72	Total Credits	4.5
Brief Introduction to Course			
<p>The task of the course is to make students to obtain basic theory, basic knowledge and basic skill of linear and nonlinear electronic circuit, cultivate students' ability to analyze and solve problems, lay good foundation for study content of certain field in electronic technology deeply and apply electronic technology into major.</p> <p>From content, students are required to master function, structure, basic working principle, performance parameters and basic analysis methods of various linear, nonlinear circuits, which should be applied flexibly into system circuit analysis. Furthermore, to enhance practical ability, in the learning process, a certain number of exercises and experiments should be completed simultaneously.</p> <p>From ability, through understanding of various linear, nonlinear circuit equivalent, engineering approximate analysis method, let students learn to analyze working principle of various unit circuit, linear integrated circuit, system electronic circuit and can solve various practical problems.</p> <p style="text-align: center;">Basic requirements for teaching</p> <p>(1) Can understand working principle, feature and application of common semiconductor devices, basic amplifying circuit, feedback amplification circuit, integrated operational amplifier, direct current regulated power supply and so on. Also remember the basic knowledge of the above content, and can identify and judge in the knowledge content range by using these principles and concepts. Can understand and master composition and analysis method of basic electronic circuit in common use, and can analyze and estimate their main index.</p> <p>(2) Familiar with nonlinear electronic circuit analysis method, master general characteristics of elements, devices and components in nonlinear electronic circuit, and master all kinds of nonlinear amplifying circuit, sine wave oscillator circuit, amplitude modulation circuit, amplitude modulation signal demodulation, mixing and angle modulation circuit.</p> <p>(3) Can use the learned knowledge comprehensively to analyze and estimate more complex electronic circuit composed of a number of basic electronic circuit units. Have ability of nonlinear circuit system analysis and design.</p>			

Course	Digital Electronic Technology		
Course No.	0908003	Semester-open	5
Total Hours	56	Total Credits	3.5
Brief Introduction to Course			
<p>As one of the most elementary curriculums of electronic engineering, digital circuit is of great practice. With a complete system of knowledge structure, including basic gates, combinational logic circuit, sequential logic circuit, programmable logic devices as well as peripheral circuit, basic theories, knowledge and commonly used skills will be mastered. Moving forward to educate the abilities of digital design and circuit design. Laying foundation for further education.</p> <p>Besides, being a pioneer course of the VHDL language, technology and application of SOPC and DSP development and design, digital circuit is gradually becoming a dispensable groundwork.</p>			

Course	Fundamental of Electronic Engineering Circuit		
Course No.	0908001	Semester-open	3
Total Hours	56	Total Credits	4
Brief Introduction to Course			
<p>Fundamental of electronic engineering circuit is a kind of fundamental platform curriculum which faces to the undergraduate students in the higher colleges and universities of science and technology. It aims to teach the most elementary and primary knowledge of electronic engineering circuit to varies majors and professionals.</p> <p>At present, with its rapid development, electronic technology application is so extensive that it infiltrates into other fields and domains more and more. Therefore, its progress and promotion plays an essential role in the construction of our socialist modernization.</p> <p>The main contents of this course are to study elements circuit components, the concept, principle, theorem and law. And then it analyzes the essential features, convention and properties of circuit in the following electronic circuits:</p> <ul style="list-style-type: none"> • Direct-current circuit and sinusoidal steady-state analysis separately; • Mutual inductance circuit and the resonant circuit; • Three-phase circuit system; • Periodic non-sinusoidal circuit; • First-order circuit; • Time-domain solution of transient process. <p>The main objective of this course is to present circuit basic theory and analysis method in a manner that is clear, interesting, and easy to understand. Moreover, the students can build an understanding of concepts and ideas explicitly on electronic circuit, and process an elementary ability of laboratory experiment and engineering practices in terms of this course's learning. The another main objective is to lay such a certain foundation that students can enhance further research and can be engaged in the related professional work.</p>			

Course	Fundamentals of Machinery		
Course No.	0907021	Semester-open	3
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Fundamentals of Machinery are a backbone professional foundation course of all kinds of science and engineering majors. It occupies very important position in the cultivation of the students' knowledge, ability and quality system. This course is for students to engage in mechanical design, manufacturing, research and development of products, to strengthen students' ability to adapt to the mechanical technical work in various types of senior professional engineering and technical personnel from the global view. The task of this course is to make the students master the basic theories of mechanisms, basic knowledge and basic skills, and learn methods of analysis and synthesis of mechanisms, and has the preliminary ability to design mechanical system movement scheme.</p> <p>To identify research object and content of this course and its status, tasks, and functions. To understand the development course and trend of mechanical design and related theory. To analyze the planar mechanism; to familiar with structure, characteristics and applications common mechanisms; to understand the basic knowledge of mechanism combination; to understand the general process of mechanical system design and basic knowledge of innovative design; to master the basic steps, content and method of mechanical system movement scheme design; to understand the evaluation criteria of mechanical system motion scheme.</p>			

Course	Fundamentals of Engineering Graphics		
Course No.	0907011	Semester-open	3
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>Engineering drawings is an important tool of expression and communication technology thinking, and an important technical documentation for the engineering department. This course is not only a basic course to study the drawing theories and methods, but also a general fundamental course to train the students' space thinking and design innovation capacity. By learning of this course students can be provided the basic scientific literacy with design expression, and basic knowledge and basic skills for the following essential professional drawing course.</p> <p>It is the graphical expression as a core to enable students to master the basic theory of projection, to develop the students' ability to make the drawings and to interpret blueprints. Thinking in images as the main line, to enable students to have the ability of space imagination, the imagination thinking and creative thinking.</p>			

Course	Programming Foundation (C language)		
Course No.	0906011	Semester-open	2
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Fundamentals of Programming is a basic course, programming is one kind of important ability. Through the learning to enable students: Get the concepts of high-level language. Get basic thinkings ,methods and skills in programming. Cultivate the abilities of the students in both problem-solving and problem-analysing, as well as the thinkings of problem-processing with the help of computer. Get the basic programming ability in problem-solving. Activate the students to apply what he or she learnt in this course to other courses. Cultivate the students in information and logical thinking.</p>			

Course	Fundamentals of College Computer A		
Course No.	0906001	Semester-open	1
Total Hours	16	Total Credits	1
Brief Introduction to Course			
<p>Broaden students' vision and do the necessary knowledge preparation for the further study of courses, which make students consciously refer to and introduce some theory, skills and methods of computer science. Expect that they can know how to use the computer, know and deal with the possible problems when using it at higher levels.</p> <ol style="list-style-type: none"> 1.Computer system components 2.The basic principles of the network, composition and application 3.The basic concepts of database Initially 4.The data structure and operation of related concepts 			

Course	Basic mechanics		
Course No.	0902401	Semester-open	3
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>The task of this course is to enable students to master the basic laws of and research methods of the equilibrium of particles, particle system and rigid bodies. It cultivates student's clear basic concepts, necessary basic knowledge, and more skilled calculation, certainly analytical and preliminary experimental capabilities of rod strength, stiffness, and stability. It will lay the necessary foundation for learning the relevant successor courses. Students are asked to learn the theory of applied mechanics preliminary and the methods to solve some simple practical engineering problems. Combining with the characteristics of this course, this course will also train student's dialectical materialism view of the world and students' comprehensive quality.</p>			

Course	Physical Culture		
Course No.	09160(01-04)	Semester-open	1-4
Total Hours	128	Total Credits	4

Brief Introduction to Course

Physical culture aims to enhance students' physical awareness, improve their physical ability and promote physical and mental development by means of appropriate physical education and scientific exercise. The course helps students to develop the habit of exercise, to receive a good moral education and to become all-round talent. Its tasks are as follows.

1. Guide students to exercise in order to improve fitness and health, to enhance their ability to adapt to environment and to promote an all-round development.

2. Develop students' awareness of exercise and improve their physical ability. Through this course, students are bound to master the basic knowledge about physics, acquire the correct sports concepts, grasp basic knowledge about exercise as well as theoretical and technical knowledge about several specialized sports and develop the good habit of scientific exercise.

3. Develop students' moral traits such as patriotism and collectivism. Via establishing the correct sportsmanship, this course encourages students to have a positive spirit with courage, teamwork, innovation and mettle.

Course	Situation and policy		
Course No.	09131(36-39)	Semester-open	2-5
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>Course purpose Situation and policy class as an important part of ideological and political theory course, student is main channel and position in the education of situation and policy. The teaching purpose of this course is for students to focus on the hot issues and thought characteristic, to help students recognize the situation both at home and abroad, to guide students to full and accurate understanding of the party's line, principles and policies, firmly in the road of socialism with Chinese characteristics under the leadership of the communist party of China's confidence and determination, to devoted great cause of reform and opening up and modernization construction.</p> <p>Students are required to grasp the party's basic theory, basic line, basic program and basic experience; To recognize the situation of China's reform, opening up and socialist modernization construction, to task and achievements; Understand the current status, development trend of international situation and international relations and foreign policy in our country, to understand the major events in the world and the Chinese government's principled stance; On this basis, to set up the Marxism situation, policy, to improve political acumen and political discrimination.</p>			

Course	Introduction to Mao Zedong thought and socialist theoretical system with Chinese characteristics		
Course No.	09131(27-28)	Semester-open	5-6
Total Hours	96	Total Credits	6
Brief Introduction to Course			
<p>Course purpose Through learning of this course, the course make students fully and accurately grasping the historical process of sanitization of Marxism and its basic rule, grasping the formation and development of Chinese Marxism three leap, grasping the sanitization of Marxist theoretical system of the three great achievements, to students to learn, with the purpose of the sensitization of Marxism.</p> <p>Teaching basic requirements:</p> <ol style="list-style-type: none"> 1. Through the study of this course, make students understand the three theoretical achievements of sanitization of Marxism in guiding Chinese revolution and construction in the important historical status and role; 2. Master of the sanitization of Marxism basic theory and the spiritual essence, help them establish scientific socialist beliefs and the common ideal of socialism with Chinese characteristics; 3. Strengthen the party's basic line and basic program of self-consciousness and firmness, for the comprehensive construction well-off society and realize socialist modernization to make their due contributions. 			

Course	College English		
Course No.	09120(01-04)	Semester-open	1-4
Total Hours	224	Total Credits	14
Brief Introduction to Course			
<p>College English (1-4) is a common basic course of a college curriculum. It is a required course for the first and second year non-English major undergraduate students. The course focuses on improving the skills of listening, speaking, reading, writing, and translation. The teaching contents are theme-based, covering all the aspects including living, studying and working etc... According to the differences in the student's ability, the course takes graded teaching in small classes, with an aid of multimedia and network in the teaching process. The aim of the course is to improve the students' ability of language use, especially the ability of listening and speaking, so that they can effectively communicate in English in their future jobs and social communication.</p>			

Course	Physics Experiment of College		
Course No.	09110(17-18)	Semester-open	2-3
Total Hours	72	Total Credits	4.5
Brief Introduction to Course			
<p>Physics experiment course is a compulsory course for students of science and Engineering Specialty in basic training of students' scientific experiment. Students will receive system experiment method and experiment skill training beginning.</p> <p>Physics experiment course coverage, has the thought, method, means rich, but also can provide comprehensive very strong basic experimental skills, is to cultivate the students' ability, scientific experiment plays an important role in improving the quality of basic science. It is in the cultivation of students' rigorous academic attitude, active innovation consciousness, linking theory with practice and adapt to the development of science and technology of comprehensive application ability with other courses irreplaceable role.</p> <p>The specific task of this course is to:</p> <p>To cultivate the basic science students experiment skill, improve the scientific experiments of the basic quality of students and make students grasp the ideas and methods of experimental science. The cultivation of students' scientific thinking and innovative consciousness, to enable students to master the basic methods of experimental study, improve students' analysis ability and innovation ability. To improve the scientific literacy of students, training scientific style of linking theory with practice and seek truth from facts, serious and rigorous scientific attitude, initiative, discipline, unity and cooperation, good moral character and take good care of public property.</p> <p>1) Master the concepts of measurement error and uncertainty, and learn to evaluate the results of direct and indirect measurement using uncertainty gradually. Have the basic ability of experimental data processing correctly. Master commonly methods of data processing, including tabulation method, graphic method and least square method. Master the basic software of experimental data processing by computer.</p> <p>2) Master the measurement method of fundamental physical quantity.</p> <p>3) Understand the general physics experiment method, and the other methods that have been used widely in modern scientific research and engineering technology, then learn to use it gradually.</p> <p>4) Know the performance of general experimental instruments and can use it correctly. Understand the modern physical techniques used in modern scientific research and</p>			

engineering technology.

5) Master the general experimental operation techniques and the adjustment of instrument used in modern scientific research and engineering technology correctly.

6) Know the historical materials of physics experiment and its application in modern science and technology.

7) The ability of experiment independently — Master the experimental principle and method and prepare for the experiment by reading the experiment teaching material, querying the relevant information and thinking the question. Use the instruments and ancillary equipment correctly, finish the experiment content independently, and write the qualified experimental report. Developing the students' ability of independent experiment, and formed the basic capabilities of independent experiments gradually.

8) The ability of analyze and research — Can analyze, judgment and conclude the result of experiment by synthesizing the experiment principle, design idea, experimental method and the related theoretical knowledge. Master the basic method of study physical phenomena and laws through experiment and obtain the ability of preliminary analysis and research.

9) The ability of unite theory with practice — Can found and analyze problem in experiment and learn the scientific method to solve it. Improve the students' ability of solve practical problems by learned knowledge and skills gradually.

10) The ability of innovation — Can finish the designed experiment and comprehensive experiment which meet the requirements of standard, then carry on some research experiment or creative experiment. Stimulate initiative of study and develop innovation ability of students gradually.

Course	College Physics A		
Course No.	09110(12-13)	Semester-open	2-3
Total Hours	128	Total Credits	8
Brief Introduction to Course			
<p>Physics is the basic structure of matter, the basic form of exercise, interaction and transformation of the law of natural science. Its basic theory permeates all areas of natural science applied to many sectors of production technology; it is the mother of natural sciences and engineering technology base. Basis for the content of college physics course is the professional colleges of science and engineering students in general knowledge of important basic course required. College physics course for students will systematically lay the necessary physical infrastructure; training students to establish a scientific world view, and enhance students to analyze problems and problem-solving skills, training students the spirit of exploration and innovation, etc., with other courses cannot replace the importance of Effect.</p> <p>Through the college physics course so that students learn the basic concepts of physics, the basic theory and basic methods more systematic understanding of knowledge and the right for students to learn professional knowledge and modern science and technology to lay a solid foundation. Teaching at the university in all aspects of physics, the emphasis on students to analyze and solve problems ability, students focus on the spirit of exploration and innovation in training and strive to achieve student knowledge, ability, quality and coordinated development.</p>			

Course	Calculus A		
Course No.	09110(01-02)	Semester-open	1-2
Total Hours	188	Total Credits	12

Brief Introduction to Course

Calculus is an important fundamental theoretical compulsory subject for students of all majors in advanced engineering universities. It aims to cultivate special talents of high quality for our socialist modernization of the country.

By teaching this subject, teachers aim to help students grasp the basic concepts, theories and operations of calculus, and cultivate the abilities of abstract thinking, logistic derivations, spatial imaginations and self-study after systematic studies and strict trainings.

Special attentions should be paid to help students cultivate the abilities of skilled computation, and the abilities of using the knowledge they learned to analyze and solve the problems.

By teaching this course, teachers are aimed to help students to grasp the basic conceptions, theories and operation skills of functions, limits, continuous, calculus of one variable, calculus of multi-variables (including curves, and curved integral), infinite series, ordinary differential equations. The course will pave the solid mathematical base for the students to study the follow-up courses and to gain further the mathematical knowledge.

Help the students cultivate the abilities of logistic thinking and abilities of using the knowledge they learned to solve the practical problems.

Course	High Frequency Electronic Circuit Experiments		
Course No.	09081(03-04)	Semester-open	5-6
Total Hours	32	Total Credits	1
Brief Introduction to Course			
<p>High frequency electronic circuit is a technological basic course to students who major in communication, electronics, information and so on. The course research object is based on communication system and mainly study the functional circuits in transmitting and receiving equipment. Thought course learning, students should establish the overall concept of information transmission system, grip the principle and structure of wireless transmitting system and receiving systems, grasp the basic concepts, principles, analysis methods and implementation methods of the functional circuits in communication systems. At the same time, students should be familiar with development and application of new technologies and devices in high frequency circuits and lay a good foundation for further courses studying. Through the course of learning, students should have the ability of designing and analysis high frequency circuits, understand the basic analytical methods and characteristics of nonlinear circuits deeply, foster students' capability of scientific research, technology development and product design in electronic information subject.</p> <p>(1) Grasp the basic concept, function, classification and main technical indicators of high frequency circuits.</p> <p>(2) Master the basic circuit of high frequency, including selected frequency circuit, matching networks, small signal amplifier, resonant power amplifiers, sine wave Oscillation circuit, modulation and demodulation circuits, mixing circuit, feedback control circuit and frequency synthesis circuits.</p> <p>(3) Master the basic analysis method of high frequency circuits, including equivalent parameter method, line method and other methods for proximate analysis of nonlinear circuits, circuit analysis method of time - varying circuits, frequency spectrum analysis method for removal of circuit.</p> <p>(4) Understand the engineering of high frequency circuits and systems, grasp components and circuits' using and analysis methods in the background of high frequency and Nonlinear state.</p>			

Course	Electronic Technology Fundamental Experiment		
Course No.	09081(01-02)	Semester-open	4-5
Total Hours	32	Total Credits	1
Brief Introduction to Course			
<p>Electronic Technology Fundamental Experiment is related to Analog Electronic Technology. The task is to train and raise the basic techniques of the students, and consolidate the theory, and improve the abilities of analyst and problem solution, set a good practice basic for the project capacities.</p> <p>(1). strengthen the usage of oscilloscope, signal generator, AC Voltage micrometers, power supply, transistor curve tracer, Frequency Counter. Identify different semiconductor devices. Grasp the test skills of semiconductor devices.</p> <p>(2). grasp the adjustment method and testament of different combination amplify circuit. Familiar with the measurement of circuit gain, maximum output voltage, input resistance, output resistance, frequency response curve. Familiar with the measurement of different parameters of amplifiers.</p> <p>(3). familiar with the skills of consulting the devices handbook and choosing reasonable devices.</p> <p>(4). learn the method to arrange and construct the circuit on the lab board, avoiding parrot-fashion.</p> <p>Electronic Technology Basis Experiments are related to analog electronics and digital electronics theory courses, which aims to develop and improve the students' basic experimental skills, consolidate relevant theoretical knowledge and improve their flexibility to apply the theoretical knowledge to analyze and solve practical problems, in order to develop and improve the students' practical abilities to lay a good foundation for further practice.</p> <p>1. Strengthen the proper use of electronic instruments which include oscilloscopes, signal generators, AC millivolt meter, DC power supply, transistor curve tracers, frequency meter and other commonly used analog devices. Identify and master various semiconductor devices and the testing skills for semiconductor devices.</p> <p>2. Master varieties of quiescent operating point adjustment and testing methods of unit combination amplifier circuits. Handle circuit magnification, the maximum undistorted output voltage, input resistance, output resistance, frequency characteristic curve measurement</p>			

method. Gasp a variety of amplification circuit performance measurement skills.

3. Master inspection manuals and the skills of rationally use common components.

4. Learn breadboard circuit layout, installation methods. Avoid simple mechanical imitation.

5. Master PLD programmable device system and complete the design of digital system.

6. Proficiency in EDA design both in the field of software and hardware description language.

7. Cultivate the abilities in independent experiments and preliminary design of experiments. Inspire students' creative thinking and be able to analyze and eliminate some of the simple failure, also correctly read and record the experimental data as well as plotting.

8. Cultivate the abilities to write report based on experimental data and experimental results and the capabilities to analysis and interpret the results.

9. Promote independent thoughts and the diversity of design as well as choose topics. Encourage those who innovate.