



哈爾濱工程大學  
Harbin Engineering University

Nuclear Engineering and Technology  
Academic Program of Undergraduate Education  
(2009 edition)



July 2013

## 080502 Nuclear Engineering and Technology (核工程与核技术专业)

**Training Purpose of Specialty:** To train the student to meet the requirements of the national economy development and national defense nuclear science technology industry development. To train the student to be with solid foundation of mathematics and physics, to be with the systematic knowledge of the major of Nuclear Reactor Engineering, and the fundamentals of the related thermal engineering, electro ethnics and computer technology. In addition, the student will have the basic knowledge of the humanities, social sciences and economy management, be able to work in the relevant fields of nuclear engineering and technology to do research, design, manufacture, operation and management.

**Training Requirement of Specialty:** Be with a solid foundation of mathematics and physics. Be proficient in a foreign language. Systematically master the fundamentals of nuclear engineering and technology, and the engineering technology. Have the basic knowledge of electro ethnics, computer and information technology. To have an understanding of the development trend of this major. Have knowledge of technical writing. Have proper knowledge of the national policies about nuclear science and technology, intellectual property, laws and standards, nuclear engineering and environment, economy management, etc. Have a certain basic learning of humanities, arts and social sciences. Have the ability to communicate study individually, team work and analyze and solve practical problems. After graduation, the students should be able to be engaged in researching, designing, building, operating and managing in the fields of nuclear engineering and technology, such as nuclear electricity, marine nuclear power, and nuclear heat supply.

Graduate students should:

1. Master the basic theories and methods of mathematics and physics, have a solid foundation of mathematics and physics.

2. Master the theories and methods of mechanics, machineries, electro ethnics and electronics, engineering graphics, computers, have a relatively solid engineering foundation.

3. master the theories and methods of reactor physics, fluid mechanics, thermodynamics, and heat transfer and reactor thermal-hydraulics, has a solid professional foundation, be able to design, analyze and process data.

4. systematically master the knowledge and modern design methods of nuclear engineering and technology, have the knowledge of nuclear safety and culture, acquire the practice training, have the knowledge of the frontier and trend of the specialty development, be able to distinguish, guide and solve engineering problems, be able to design and research in the field of this major.

5. be proficient in a foreign language, be able to read and write materials in professional foreign language; master the application of information technology, be able to search literatures in Chinese or in a foreign language, be able to learn, master technical writing, be

able to efficiently express and communicate orally and in written form.

6. have the general education, have the knowledge of modern society problems, have a certain basic learning of humanities, arts and social sciences, understand the national policies and regulations about technology, intellectual property, understand the influence of engineering on society, economy, environment and global development.

7. Have the attitude of team work, be able to play a role in a multi-discipline team.

8. Have good ethic, have good occupation morality and a strong social responsibility.

Graduation Standard: The students of this Major should obtain 180 credits at least, among them, theoretical courses 109 credits, practical teaching parts 49 credits, specialized optional courses 12 credits, optional courses of general education 10 credits.

Key Subject : Nuclear Science and Engineering, Thermal Energy Science and Engineering

Main Courses: Nuclear Physics, Nuclear Reactor Physics, Engineering Thermodynamics, Heat Transfer, Engineering Fluid Mechanics, Two-Phase Flow, Reactor Thermal-Hydraulics, Reactor Structure and Materials, Reactor Radiation Measurement Technology, Nuclear Power Plant and Equipments, Introduction to Nuclear Power Safety, etc.

Schooling: Quadrennial

Awarding Degree: Bachelor of engineering

核工程与核技术专业人才培养方案指导性计划进程表（一）  
Curriculum Of The Major For Nuclear Engineering and Technology (1)

Curriculum Platform	Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester	
					Theory	Practice		
Foundamental 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			

核工程与核技术专业人才培养方案指导性计划进程表（二）  
Curriculum Of The Major For Nuclear Engineering and Technology (2)

Curriculum Platform	Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester	
					Theory	Practice		
Specialized Curriculum Platform	Specialized Fundamental Courses	0915001	Nuclear Physics	3	48		4	
		0915002	Nuclear Reactor Physics	3	48		5	
		0915003	Radiation Protection and Safety	2	32		4	
		0915004	Automatic Control Theory	2.5	40		5	
		0915135	Engineering Thermodynamics	4	64		4	
		0915101	Engineering Fluid Mechanics	4	52	12	4	
		0915136	Heat Transfer Theory	4	60	4	5	
		0915102	Two-phase Flow	2	32		6	
		0915103	Reactor Structure and Material	2	32		5	
	Specialized Key Courses	0915104	Reactor Thermal Hydraulics	2.5	40		6	
		0915105	Nuclear Power Plants and Equipments	5	80		6	
		0915125	Nuclear Power Safety Introduction	2	32		7	
		0915106	Detection Technique of Nuclear Engineering	2	32		7	
		0915128	Radiation Monitoring Technology of Nuclear Power Plant	2	32		7	
	Specialized Practice	0903303	Experiment of thermal technology	0.5		16	4-5	
		0915108	Integral Experiments for Subjects and Specialty	1		32	7	
		0915109	Internship	3		3weeks	6	
		0915110	Major Design I	1		1week	5	
		0915111	Major Design II	3		3weeks	6	
		0915112	Major Design III	2		2weeks	7	
		0915127	Graduation Project	8		16weeks	8	
	Optional Courses				12	12 credits at least		
	Sub-total Credits				70.5			
	Total				180			

核工程与核技术专业选修课设置一览表  
Optional Courses of the Major of Nuclear Engineering and Technology

Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester
				Theory	Practice	
Specialized Optional Courses	0915006	Reliability Engineering	2	32		4
	0915007	Principle and Application of Single-Chip	2	24	8	4
	0915008	Principle and Interface Technique of Micro-computer	3	40	8	5
	0915126	Specialty English Reading	2	32		6
	0915113	System Engineering and Analysis	2	32		6
	0915114	Method and Application of Numerical Calculation	2	32		7
	0915115	Nuclear Power Plant Operation	2.5	28	12	7
	0915116	Project Management of Nuclear Power Plant Engineering	2	32		7
	0915117	Nuclear Power Plant Electrical System	2.5	40		6
	0915118	Basis of Electric and Electric Drive Engineering	2	32		5
	0915119	Nuclear Power Equipment Controlling System	2	26	6	7
	0915120	Nuclear Power Plant Digital I&C System	2	32		7
	0915121	Pumps and Valves of Nuclear Power Equipment	2	32		6
	0915122	Nuclear Energy and Environment	2	32		5
	0915123	Experiment Design and Data Processing	2	32		5
	0915124	Nuclear Fusion and Plasma Physics	2	32		5
	0915134	Quantum Mechanics	3	48		4
	0915107	Nuclear Reactor Control and Protection	1.5	24		7
	0915129	Radiation Detecting	2	32		5
	0915130	Basis of Nuclear Electronics	2	32		5
	0915131	Principle and Application of Macerator	2	32		6
0915132	Radioecology	2	32		6	
0915133	Monte Carlo Method and Application	2	32		7	
0917301	Engineering Comprehensive Training	2		2weeks	7	
Sub-total credits			51			

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	Heat Transfer Theory		
Course No.	0915136	Semester-open	5
Total Hours	64	Total Credits	4
Brief Introduction to Course			
<p>Heat transfer is a course of energy engineering that concerns the generation, use, conversion, and exchange of thermal energy and heat between physical systems. Heat transfer is classified into various mechanisms, such as thermal conduction, thermal convection, thermal radiation, and transfer of energy by phase changes. Heat conduction, also called diffusion, is the direct microscopic exchange of kinetic energy of particles through the boundary between two systems. When an object is at a different temperature from another body or its surroundings, heat flows so that the body and the surroundings reach the same temperature, at which point they are in thermal equilibrium. Heat convection occurs when bulk flow of a fluid (gas or liquid) carries heat along with the flow of matter in the fluid. The flow of fluid may be forced by external processes, or sometimes (in gravitational fields) by buoyancy forces caused when thermal energy expands the fluid (for example in a fire plume), thus influencing its own transfer. The latter process is often called "natural convection". Thermal radiation occurs through a vacuum or any transparent medium (solid or fluid). It is the transfer of energy by means of photons in electromagnetic waves governed by the same laws.</p>			

Course	Engineering Thermodynamics		
Course No.	0915135	Semester-open	4
Total Hours	64	Total Credits	4
Brief Introduction to Course			
<p>Thermodynamics is the discipline which researches the thermal phenomena, the material system in nature of the balance and energy balance relationship, as well as the status changes, the system of interaction with the outside world. Engineering thermodynamics is a branch of the thermodynamics first development, it mainly studies the law of mutual transformation between heat energy and mechanical energy and its application, it is one of the important basic subjects for nuclear engineering. The basic task of the engineering thermodynamics is to improve the utilization of geothermal energy and power conversion efficiency, based on analysis of the thermal system, thermal balance, thermal state and thermal process, thermodynamic cycle and working fluid and improving and perfect heat engine, refrigerator and heat pump cycle.</p>			

Course	Radiation Monitoring Technology of Nuclear Power Plant		
Course No.	0915128	Semester-open	7
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>This course mainly introduces relevant content of the characteristics of the radiation measuring technology and the methods of radiation measuring for nuclear power plant, topics covered include process radiation monitoring, discharge radiation monitoring, area radiation monitoring, systems of individual dose monitoring and surface contamination monitoring. The students will be familiar with the systems and principles of the radiation measuring for nuclear power plant, master methods and processes of radiation measuring, improve capability of integrating theory with practice, and have capabilities of analysis and solving problem to the general problems of radiation measuring.</p>			

Course	Graduation Project		
Course No.	0915127	Semester-open	8
Total Hours	16 weeks	Total Credits	8
Brief Introduction to Course			
<p>The graduation project is an important phase for a student to enter society to work or continue his postgraduate study from undergraduate study. Through graduation project, to train the student's abilities to use the learned fundamentals and professional knowledge, to perform scientific research individually, to do calculation and design, to perform experiments.</p> <p>The topics of the graduation projects are determined by guiding teachers based on the students' future jobs and the teachers' scientific research projects, in accordance with the objectives and requirements of the major training. The student will select a project and do research or design under the guidance of a teacher, complete a graduation thesis, and pass the final defense.</p>			



Course	Nuclear Power Safety Introduction		
Course No.	0915125	Semester-open	7
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>The generality of nuclear power safety is the marginal and multi-disciplinary subject which involves many areas. The nature of the course is the comprehensive professional backbone lesson. In the course, the nuclear safety issues of nuclear facilities is analyzed through introducing the nuclear safety concept and its theoretical development process, and in the process of nuclear facility design and operation, we should take effective measures to ensures the nuclear energy safety and reliability.</p> <p>Through the study of this course, the students should be meet the following requirements:</p> <ol style="list-style-type: none"> <li>(1) The students should understand the development of nuclear safety and the future trend.</li> <li>(2) The students should be grasping the basic concepts and theory of nuclear safety, and the basic knowledge of the nuclear power plant design.</li> <li>(3) Let students well know the knowledge of the reactor proprietary safety facilities, master the basic theory and the basic concepts of reactor operating status, accident classification and nuclear power plant safety analysis and evaluation.</li> <li>(4) Let students well understand the causes and consequences of a typical nuclear power plant accident, the corresponding safety measures and the disposal and mitigation methods of severe accidents.</li> <li>(5) This course enables the students to understand cutting-edge issues in the field of nuclear safety research, and also cultivate the students who utilizing the knowledge that they learned to solve practical engineering problems.</li> </ol>			



Course	Major Design III		
Course No.	0915112	Semester-open	7
Total Hours	2 weeks	Total Credits	2
Brief Introduction to Course			
<p>The main purpose of&lt;The preliminary design of nuclear reactors&gt; is to make students master the reactor design methods and steps, and has the ability of comprehensive consideration of reactor design. The contents include: steady state thermal design of single channel model, heat transfer check for fuel element center temperature, steady-state hydraulic calculation of reactor, pressure vessel design and calculation, the arrangement of reactor core. According to the requirement, course design specification and drawing of pressure vessel and the core arrangement drawings should be written and drawn. Through this course design, the basic skills such as engineering design、 drawing can be improved, and the serious attitude to the engineering problem can be cultivated.</p>			

Course	Major Design II		
Course No.	0915111	Semester-open	6
Total Hours	3 weeks	Total Credits	3
Brief Introduction to Course			
<p>The main task of this course is to propose the thermodynamic system principle scheme of pressurized water reactor nuclear power plant and carry out the thermal balance calculation under full power condition.</p> <p>The main contents of this course are as follows:</p> <p>Determining the form and configuration of the secondary loop thermodynamic system.</p> <p>According to the given overall requirements and constraints, determining the main thermal parameters of thermodynamic system.</p> <p>According to given original data, carrying out thermal balance calculation of the thermodynamic system for the given load level, and determining the various process parameters such as steam flow rate, water flow rate, pump head, total plant thermal efficiency, and so on.</p> <p>Writing design specifications, and drawing the thermodynamic system flow diagram.</p>			

Course	Major Design I		
Course No.	0915110	Semester-open	5
Total Hours	1 week	Total Credits	1
Brief Introduction to Course			
<p>To learn the design and calculation of a kind of shell-and-tube heat exchanger. To master the design calculation of a segmentally baffled shell-and-tube heat exchanger. To train the capability of scheme design and structure design of heat exchanger.</p> <p>In this course, the student will complete the thermal calculation of a shell-and-tube heat exchanger, the hydraulic calculation of the tube course and the shell course of the designed heat exchanger, compile a design instruction, draw a blueprint of the heat exchanger structure.</p> <p>Through this major design, the student will enhance the learned fundamentals, apply the learned knowledge of engineering fluid mechanics, heat transfer to the practical design of a heat exchanger. To train the student's ability to search and use literatures. To train the student's ability to select scheme and analyze data. To train the student to engineering design ability and a serious attitude to work.</p>			

Course	Internship		
Course No.	0915109	Semester-open	6
Total Hours	3 weeks	Total Credits	3
Brief Introduction to Course			
<p>The internship is an important phase in the student education. Study extends from class to practice. It is significant for students to understand the knowledge they learned from classes. To visit the real objects in site and listen to explanations, the student will understand the fabrication and installation technics of nuclear reactor and equipments, get a practical understanding of the constitute, function and layout of a nuclear power plant, the structures of main equipments, the pumps, valves, pipes and so on. The student will understand the operations during different stages of reactor, the characteristics of different types of reactors, the basic concepts of main equipments and steam water cycle. The student will learn the reactor operation, the criticality safety precautions, and the various factors influencing reactivity.</p>			

Course	Integral Experiments for Subjects and Specialty		
Course No.	0915108	Semester-open	7
Total Hours	32	Total Credits	1
Brief Introduction to Course			
<p>Integral experiments for subjects and specialty deal with the measurement of physical quantities such as temperature, pressure, flow and radiation dose. The purpose of this course is a good comprehension and acquisition of knowledge of nuclear engineering and technology experiment for students. Another purpose is an increase of cognition and promotion of the combination between theory and practice. The last purpose is to build the capacity of analyzing and solving problems for students majoring in nuclear engineering and technology.</p> <p>Basic requirements:</p> <ol style="list-style-type: none"> <li>1. Comprehension of some basic experiment and basic experiment method, acquisition of the function and skills for proper use of common basic instruments. Comprehension of different kinds of nuclear meter and acquisition of the experiment skills.</li> <li>2. Learn to formulate the experiment programs and experiment procedure and deploy the experiment apparatus and to discover, analyze and solve problems. Priliminarily master the ability to process the experiment data, to determine the experiment results and to express the experiment results.</li> </ol>			

Course	Detection Technique of Nuclear Engineering		
Course No.	0915106	Semester-open	7
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>Nuclear engineering detection technology is essential, professional and technical basis for technical personnel who engaged in nuclear power operation. You can understand the operational status, security, economic and other indicators of nuclear power equipment by accurate determination of various physical quantities in nuclear power, and the nuclear engineering detection technology is also the basis of the nuclear power equipment automation.</p> <p>The task of this course is to enable students to master the main parameters of the various detection methods when the nuclear power is operating, understand the basic concepts of nuclear engineering detection technology. To master the detection method and its characteristics of various instruments, to understand principle and characteristics of instrumentation, and to have the ability of the correct analysis and handle the test data which are the task of this course. So the students are able to select and use the instrument when nuclear power plants and ships are designed, constructed and operating.</p>			

Course	Nuclear Power Plants and equipments		
Course No.	0915105	Semester-open	6
Total Hours	80	Total Credits	5
Brief Introduction to Course			
<p>Nuclear Power Plants and equipments is the main specialized course for the specialty of Nuclear Reactor Engineering in Harbin Engineering University. The contents of this course are chiefly as follows:</p> <p>Basic principle, main performance indexes and the technical development trends of nuclear power plant with pressurized water reactor.</p> <p>Main functions, basic composition and operation principles of main process systems in primary and secondary loop system.</p> <p>Basic structure and operating principle of major nuclear power equipments such as steam generator, pressurizer, steam turbine, and condenser.</p> <p>Features of metal materials corrosion and the methods of water treatment in the nuclear power plants.</p> <p>Thermodynamics cycle of secondary loop, main factors that impacting on plant thermal efficiency and thermal balance calculation methods of thermodynamic system.</p> <p>Steady-state operation performances of nuclear power plants, and basic principles of reactor power control, steam generator level control and pressurizer pressure control.</p>			

Course	Reactor Thermal Hydraulics		
Course No.	0915104	Semester-open	6
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>Thermal hydraulic analysis of nuclear reactor is an engineering subject focusing on the mechanisms of heat transfer and coolant flow. It is one of most important courses for the undergraduate students majored in nuclear reactor engineering. The course is meant to cover thermal hydraulic design and analysis of the core of a nuclear reactor. It is emphasized on both the fundamental principles of thermal analysis of nuclear system and the empirical data, engineering properties and computer techniques required for assessment of thermal hydraulic characteristics of nuclear reactor. This course is intended to provide the basic knowledge framework for nuclear engineering students, which are anticipated to be able to perform the steady thermal hydraulic design of nuclear reactor. The course covers the stricture introduction of conventional pressurized water reactor (PWR), steady state power generation and distribution in conventional PWR, heat transfer calculation in nuclear reactor, coolant flow behaviors and the hydrodynamic analysis in nuclear reactor, and steady state and transient thermal analysis for conventional PWR.</p>			



Course	Reactor Structure and Materials		
Course No.	0915103	Semester-open	5
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>Reactor Structure and Materials is one main engineering subject, which is one of most important courses for the undergraduate students majored in nuclear reactor engineering. The basic objective of this course is to cultivate the engineers and technicians working in the nuclear power industry. The main focuses of the course are both to supply basic knowledge of components structures in different reactors and to understand properties, requirements of materials used in nuclear reactor. The course covers following components in structure introduction part, i.e., reactor vessel, reactor internals, control rod driving mechanisms, etc. The categories, requirements and properties are introduced for such materials used as nuclear fuel, moderator, coolant, structure, and activity control in nuclear reactor. Furthermore, the boiling water reactor, heavy water reactor, high temperature gas-cooled reactor and fast neutron breeding reactor are also generally introduced. Another task of the course is to train the advanced design methodology and to promote the capability to solve practical problems.</p>			

Course	Two-phase Flow		
Course No.	0915102	Semester-open	6
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>Two-phase flow is always encountered in chemical engineering, energy sources and power engineering, and is also a basic subject in nuclear energy, power, chemical engineering and spaceflight. Through this course, students can master the most fundamental physical phenomenon and process as well as basic engineering approaches involved two-phase flow and boiling heat transfer, e.g. basic features, flow pattern, the calculation of flow resistance and basic physical models, etc. Some special phenomena like critical flow, flow instability and boiling crisis are also included in this course. Meanwhile, they may acquaint themselves with the latest development of this area. Therefore, this course also can help students to improve their abilities in engineering design and undertaking research in related fields.</p>			

Course	Engineering Fluid Mechanics		
Course No.	0915101	Semester-open	4
Total Hours	64	Total Credits	4
Brief Introduction to Course			
<p>In this course, the fundamentals of engineering fluid mechanics will be presented. The student will learn and understand the mechanics of fluid at rest or in motion, and the application of the fundamentals in practical engineering. The student will learn and master the general laws of fluid motion (especially the liquid flow), the related basic concepts, basic principles and basic methods. The student will also learn and master the important continuity equation, momentum equation and energy equation, as well as their applications. The student will have the capability of solving the general problems of fluid mechanics in engineering.</p>			

Course	Automatic Control Theory		
Course No.	0915004	Semester-open	5
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			
<p>The principle of automatic control is a compulsory course for students majoring in nuclear engineering and nuclear technology. Based on classical control theory, this course deals with introduction to design of feedback control systems, properties and advantages of feedback systems, time-domain and frequency-domain performance and stability criteria. It also covers dynamic mathematical model, time-domain response analysis, root locus method, nyquist criterion, control system synthesis and design, and application of Matlab software tool in the analysis and synthesis of control system. By learning this course, the students will be able to obtain a basic understanding of feedback control systems theory, the ability to perform analysis and design of linear feedback control systems, using both time and frequency domain techniques. Moreover, the problem-solving skills and feedback control thinking will be developed to lay massive foundation for further study and future career.</p>			

Course	Radiation Protection and Safety		
Course No.	0915003	Semester-open	4
Total Hours	32	Total Credits	2
Brief Introduction to Course			
<p>This course mainly introduces relevant content of the harm of ionizing radiation and radiation protection to human, topics covered include the interactions between the rays and the materials, quantity and unit of radiation, biological effect of radiation, protection of external exposure, protection of internal exposure, principle of radiation monitoring and radiation safety. The students will be familiar with principles and criteria of radiation protection, master theory, methods and solutions of internal and external exposure protection, improve safety awareness of radiation, and then protect environment, health of professional personnel and the public.</p>			

Course	Nuclear Reactor Physics		
Course No.	0915002	Semester-open	5
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Nuclear reactor physics is the core discipline of the field of nuclear engineering. The main research content of reactor physics is the behavior of neutron in reactor and its effects on operation of reactor. The course can be divided into two parts.</p> <p>In part 1, interaction between neutron and material is introduced at first. Then the diffusion and moderation theory of neutron are introduced, and critical problem of reactor is discussed base on neutron diffusion equation. At last, reactivity coefficients, burn-up of fuel, Samarium and Xeon poisoning, neutron dynamics and control methods in reactor are discussed.</p> <p>In part 2, neutron transport theory, physical start-up of reactor and reactor core physical design method are introduced.</p>			

Course	Nuclear Physics		
Course No.	0915001	Semester-open	4
Total Hours	48	Total Credits	3
Brief Introduction to Course			
<p>Nuclear physics is a very large subject. However, the students of the College of Nuclear Sci. &amp; Tec. mostly as nuclear engineers will work with all kinds of nuclear devices, from fission and fusion reactors to accelerators and detection systems. In all these complex systems nuclear radiations play a central role. In generating nuclear radiations and using them for beneficial purposes, scientists and engineers must understand the properties of these radiations and how they interact with their surroundings. It is through the control of radiations interactions that we can develop new devices or optimize existing ones to make them more safe, powerful, durable, or economical. All these knowledge is provided by this course. Therefore, in this course we intend to emphasize the nuclear concepts, and essential for understanding nuclear radiations and their interactions with matter. The basic concepts (chapter 1), radiation and decay (chapter2, 5, 6, 7), nuclear reactions (including fission and fusion) and interaction between radiation and materials (chapter3, 9, 11) are essential. The other chapters such as nuclear structure will be introduced briefly.</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	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"> <li>• Direct-current circuit and sinusoidal steady-state analysis separately;</li> <li>• Mutual inductance circuit and the resonant circuit;</li> <li>• Three-phase circuit system;</li> <li>• Periodic non-sinusoidal circuit;</li> <li>• First-order circuit;</li> <li>• Time-domain solution of transient process.</li> </ul> <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"> <li>1.Computer system components</li> <li>2.The basic principles of the network, composition and application</li> <li>3.The basic concepts of database Initially</li> <li>4.The data structure and operation of related concepts</li> </ol>			

Course	Experiment of thermal technology		
Course No.	0903303	Semester-open	4-5
Total Hours	16	Total Credits	0.5
Brief Introduction to Course			
<p>Thermal fluid experiment is an important practical part of the academic courses of Engineering Thermodynamics and Heat Transfer. Its purpose is to further consolidate and strengthen students' understanding of the basic theory, and develop students' ability to experiment. The students are required to master the basic skills of the experiment, analyze and solve practical problems through the training of practice.</p> <p>The thermal experimental course requires students to master the experimental principle and experimental methods, learn the use of the experimental test equipment, and complete data analysis and data processing in experiments of Engineering Thermodynamics and Heat Transfer. The experimental reports are completed so students can deepen their understanding of the theory of Engineering Thermodynamics and Heat Transfer.</p>			

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			
<p>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.</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> </ol>			

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"> <li>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;</li> <li>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;</li> <li>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.</li> </ol>			

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.