哈爾濱工程大學
Harbin Engineering University

Software Engineering
Academic Program of Undergraduate Education
（2009 edition）

July 2013

080611W Software Engineering（软件工程专业）

Training Purpose of Specialty：Based on the urgent demand of high-level software talents in IT fields, nurturing high-level, high-quality, engineering-oriented, comprehensive software talents with innovation consciousness and international competence.

Training Requirement of Specialty：

(1) Theory and Knowledge Requirements: Students of Software Engineering major possess the solid fundamental knowledge of science and engineering and understand the knowledge of human and social science. They are to be equipped with solid fundamental theoretical knowledge, extensive knowledge of Software Engineering and systematic analyzing and designing technique. Essential training for computer thinking and software engineering methodology are provided in order to make students understand the current status and future trends of the development of software engineering field.

(2) Skill Requirements: Students are supposed to possess a good knowledge of language and international communication, good interpersonal relationship skills and team spirit, as well as strong engineering practical capability. They would become high level specialized talents undertaking analysis，design, development, management and maintenance task of a certain application using advanced Software Engineering methods, techniques and tools.

(3) Quality Requirements：Students are supposed to possess good political and ideological quality, moral character, and law-consciousness and group consciousness. They would have healthy physical quality and psychological quality. They are to be equipped with sharp mind, intensive study, and realistic and innovative science quality.

Graduation Standard：The requirements for the major of Software Engineering: 160 credits, To students of Software Engineering, 120.5 credits for theory compulsory courses, 39.5 credits for practical training, 10 credits for major optional courses,10 credits for the general education. To students of New Digital Media, 121.5 credits for theory compulsory courses, 38.5 credits for practical training, 10 credits for major optional courses, 10 credits for the general education.

Key Subject：Computer Science and Technology、Software Engineering

Main Courses(Software Engineering)：Discrete Mathematics、Data Structure、Computer Organization & Architecture、Fundamentals of Computer Programming、Object-Oriented Programming、Operating System、Principles of Database、Compile Principles、Algorithm Design and Analysis、Software Engineering、Software Requirements、Professional Japanese、Computer Network、Software Modeling and UML、Software Design and Architecture、Software Quality Assurance & Testing、System Analysis and Design、Professional English、Application of Project Management Software & CMM、Mobile Programming Technology，Java Programming、Electronic Government Requirement Method。

Main Courses (New Digital Media)：Discrete Mathematics、Data Structure、Computer Organization & Architecture、Fundamentals of Computer Programming、Object-Oriented Programming、Operating System、Principles of Database、Compile Principles、Algorithm Design and Analysis、Software Engineering、Professional Japanese、Computer network、Computer Graphics、Digital Image Processing、Professional English、Pencil sketch、Color、Digital Media Technology and art、Scene Design、Character Design、3D Animation Technology （Maya）、Animation Principle、Animation Technology、Basic of Game Programming、Game Programming。

Schooling：Quadrennial

Awarding Degree：Bachelor of engineering

软件工程专业人才培养方案指导性计划进程表（一）
Curriculum Of The Major For Software Engineering（1）

Curricullum 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
		0920001	College Japanese Ⅰ	3	48		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			39.5			
	Natural Science and Technology	09110(01-02)	Calculus A	12	188		1-2
		0911006	Linear Algebra and Analytic Geometry A	4.5	64	8	1
		0911008	Probability and Statistics	4	64		2
		09110(12-13)	College Physics A	8	128		2-3
		0907011	Fundamentals of Engineering Graphics	2.5	40		3
		0908001	Fundamental of Electronic Engineering Circuit	4	56	8	3
	Sub-total Credits			35			
	Practice	0916101	Military Training	3		3weeks	1
		09110(17-18)	Physics Experiment of College	4.5	4	68	2-3
	Sub-total Credits			7.5			
	Optional Courses for General Education			10	10 credits at least		
Total				92			

软件工程专业人才培养方案指导性计划进程表（二）
Curriculum Of The Major For Software Engineering（2）

Curricullum Platform	Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester
					Theory	Practice	
Specialized Curriculum Platform	Specialized Foundamental Courses	0920101	Introduction to Software Engineering	1.5	32		1
		0920102	Computer Professional Ethics	1	16		4
		0920103	Intellectual Property Law	1	16		6
		0920104	Discrete Mathematics	3	72		2
		0920105	Computer Organization and Architecture	3	72		3
		0906506	Database Principles	2	32	16	4
		0906505	Operating Systems	2	54		4
		0906502	Data Structure	2.5	64		3
		0906507	Computer Network	2	48		6
	Specialized Key Courses	0920111	Fundamentals of Computer Programming	2.5	36	24	1
		0920112	Object-Oriented Programming	3.5	40	40	4
		0906512	Design and Analysis of Algorithm	2	32	8	5
		0920113	Software Engineering	1.5	36		4
		0920122	Java Programming	2	32	16	2
		0906516	Compiler Construction Principles	2	40	16	6
		0920114	Software Requirement	2	40		4
		0920115	Software Modeling with UML	1.5	20	16	5
		0920116	Software Design and Architecture	1.5	20	16	5
		0920117	Software Quality Assurance and Testing	2	32	16	5
		0920118	System Design and Analysis	2	40		5
		0920119	Software Project Management and CMM	1.5	36		6
		0906518	Computer Graphics	2	32	8	5
		0920210	Digital Image Processing	2	32	8	5
		09202(01-02)	Sketching	2.5	20	40	1、3
		09203(01-02)	Color	2.5	20	40	2、4
		0920213	Scene Design	1.5	20	16	5
		0920214	Character Design	1.5	20	16	5
		0920215	Digital Media Technology and Art	1.5	36		6
		0920120	Case Teaching of Software Ⅰ	3		3weeks	6
	Specialized Practice	0920311	Operating System Experiment	1		32	5
		0920312	Hardware Experiments of Computer	1		32	3
		0920313	Database Design Practice	1		32	4
		0906550	Experiments of Data Structure and Programming	1		32	4
		0906554	Computer Network Experiment	0.5	4	12	6
		0920315	Software Engineering Project Practice	1.5		48	5
		0920316	Software and Hardware Comprehensive Design	2		2weeks	6
		0920317	Major Visiting Experience Training	2		2weeks	3
		0920318	Software Development Training	2		2weeks	6
		0920319	Integrated Project Experience Training	7		7weeks	7
		0920320	Graduation Project	14		14weeks	8
	Optional Courses			10	10 credits at least		

软件工程专业人才培养方案指导性计划进程表（二）
Curriculum Of The Major For Software Engineering（2）

Curricullum Platform	Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester
					Theory	Practice	
	Sub-total Credits			88			
Total				180			

软件工程专业选修课设置一览表
Opitional Courses of the Major of Software Engineering

Curriculum Feature	Course Number	Course Name	Credit	Hours		Semester
				Theory	Practice	
Specialized Optional Courses	0906500	IT English	1	32		5
	0920151	College Japanese Ⅱ	2	48		5
	0920140	Subject-Based Japanese	1	24		5
	0906256	Literature Retrieval	0.5	12	4	6
	0920149	Lectures on Software Engineering	1			1-8
	0906183	Software Security	1	24		6
	0906184	Introduction to Information Security	1	20	4	7
	0906253	Network Security and Protection Technology	1	20	4	7
	0920141	Mobile Programming Technology	1	16	8	5
	0906154	Embedded Techology	1	24		7
	0920142	J2EE and Middleware	1	20	4	5
	0920143	Android Programming	1	24		5
	0920144	Linux Kernel Analysis and Practice	2	24	24	5
	0920145	Method of E-government Demand	1	24		7
	0906167	New Database Technology	1	24		7
	0906168	Service-Oriented Architecture	1	24		7
	0920146	Personal and Team Software Process	1	24		6
	0920147	Web Service	1	24		7
	0920148	Distributed System	1	24		7
	0920150	Web Page Design	1.5		32	5
	0920224	Animation Principle	1.5	24	12	5
	0920221	Original Design	1	12	12	5
	0920222	3D Animation Technology(Maya)	1.5	24	12	7
	0906197	Artificial Intelligence B	1	16	8	5
	0920223	Digital Audio/Video Processing	1	16	8	7
	0920230	Digital video production	1	16	8	6
	0920232	The basis of two-dimensional animation	1	16	8	4
	0920225	Animation Technology	1.5	24	12	5
	0920226	Fundamentals of Animation Algorithm and Programming	1	16	8	7
	0920227	Fundamentals of Game Development	1.5	24		4
	0920228	Game Programming	1.5	24	12	5
	0920231	3D Game Technology	1.5	24	12	6
	0920229	Analysis and Design of Game Engine Architecture	1	16	8	7
Sub-total credits			38			

Course	Graduation Project		
Course No.	0920320	Semester-open	8
Total Hours	14 weeks	Total Credits	14
Brief Introduction to Course			
Graduation Project is an important teaching step in the undergraduate program, and it includes bibliographic search and reading, survey, organization of work plan, scheme comparison and selection, design and computing, system analysis, experiments, simulation and analog, data processing, program developing and testing, summary, thesis writing and defense etc.			

Course	Integrated Project Experience Training		
Course No.	0920319	Semester-open	8
Total Hours	8weeks	Total Credits	8
Brief Introduction to Course			
This course requires the students finish the development of a large-size, fully functional software project in groups, in terms of specifications and the process of software engineering, and using object-oriented programming language. They should work as if they were staff in a software enterprise and submit daily report as well as weekly report, write software requirement specifications, design documents and testing record reports,etc., including original codes. The purpose is to foster their team spirits and the capabilities of developing large-size software projects.			

Course	Software Development Training		
Course No.	0920318	Semester-open	3
Total Hours	2 weeks	Total Credits	6
Brief Introduction to Course			
This course requires the students finish individually or in group the development of medium-size software project, according to the requirement of software specifications, sticking to the specification and process of software engineering ,and using object-oriented programming language. they should submit the original codes and write the design documents and testing cases. The purpose is to foster their capabilities of real development of software projects.			

Course	Major Visiting Experience Training		
Course No.	0920317	Semester-open	3
Total Hours	1 weeks	Total Credits	1
Brief Introduction to Course			
This course covers visiting software enterprises, listening to lectures, doing extending exercises, conducting programming enhancement and developping small- scale projects. The purpose is to enable the students acquire the perceptual knowledge about the major of software engineering by the means of visits and lectures; to foster team spirit of the students by the extending training; to train the basic skills of students by programming enhancement; enable the students understand the process of software development, developing tools and management through the development of a small-scale project. Therefore ,the foundation could be settled for their future course study and profession planning.			

Course	Software and Hardware Comprehensive Design		
Course No.	0920316	Semester-open	6
Total Hours	2 weeks	Total Credits	2
Brief Introduction to Course			
This course requires the students finish a development of software-with hardware-combined android application in groups step by step. Throughout the trainings of several experimental steps, students should understand the process of android development, so as to foster their capabilities of system design and team synergy.			

Course	Software Engineering Project Practice		
Course No.	0920315	Semester-open	5
Total Hours	48	Total Credits	1.5
Brief Introduction to Course			

SE project practice teaching will make students understood clearly on software knowledge through an accomplishment of whole software development by project practicing to practice the knowledge into real. During the process, students will fulfill a serials of software tool practice to master the theory, method and technique for resolving actual problems.

Students will use the pointed software development tools, write the development document, and learn the knowledge of software development. The following item will be completed: Covering project research, project planning, requirements analysis, general design, database design, detailed design, code implementation, testing, project management, installation, deployment and bids

The course requires students to completed a whole software development project. Mentors will explain how to make the development document and how to use the basic tools of software development including 10 kinds of tools and 14 kinds of documents.

Through experiment to make the students further understand and master the software engineering principle, improve the analysis of the actual project and design ability, be familiar with and grasp of software engineering methodology, software development process, documentation writing format and specification, fully understand and well versed in the learning of theoretical knowledge, to cultivate students' comprehensive use of taught courses, analyzing the ability to solve the problem, students integrate theory with practice, seeking truth from facts, serious scientific attitude and good working attitude, engaged in scientific research work lays the foundation for the future

Course	Database Design Practice		
Course No.	0920313	Semester-open	4
Total Hours	32	Total Credits	1
Brief Introduction to Course			

The course is an essential computer practice. It is mean to provide a logic design to determinate the optimal data model and processing model, meanwhile, a physical design to determinate database storage structure and access method. The Database will be established to reflect the real world information and contact information, to meet the requirements of user data and processing requirements, and to be accepted by a database management system, at the same time to achieve system goals, and to effective access to data in the database.

The course will provide students the circumstance to design database and Implement database system environment after" database theory" course. It is a practice course to raises student's beginning ability.

The course pointed to the database constructor.The students are supposed to Master database design abilities of requirements analysis, modeling, database establishment and maintenance, database operation, advanced queries, stored procedures and triggers design

The course required students to grasp how to use the basic knowledge of database, some DBMS soft and other related tools to complete the database application analyzing, designing, and SQL realizing as following:

Built a conceptual model design, logic design and physical design, MS SQL Serve2005 and Oracle10g database introduction, installation, use of complicated SQL, database operation, actions, views, stored procedures, design, modules design, database design documentation and test plan.

Course	Hardware Experiments of Computer		
Course No.	0920312	Semester-open	3
Total Hours	32	Total Credits	2

Brief Introduction to Course

The computer hardware experiment course is a major compulsory practical course to the Software Engineering major. The computer hardware experiment uses FPGA design development environment and EDA experimental facilities as a practice platform. It studies the basic methods of digital circuit design to deepen the understanding of the knowledge unit about Computer Architecture and Organization and enhance practical skills.

The computer hardware experiment's task enable the students to deepen the understanding and the mastery of the knowledge unit about digital logic and digital systems, the organization and structure of the storage system, the interfaces and communication and the functional organization. Studying this course will develop student's initial establishment of the concept of the whole computer, make the student master the composition theory, the logic implementation, the design method and its interconnection structure of the computer's main functional components in order to lay a good foundation of computer hardware. This course will also lay a good foundation for the future work that the student will take part in such as Computer system analysis, design and development.

It not only makes students understand and master the basic organizational structure of the modern digital computer system, but also enable students to establish a complete system of computer hardware machine concept through the teaching of the course. Through practical operation, it develops students' general ability to master the basic theoretical knowledge of computer hardware systems. It focuses on training the ability to grasp the basic knowledge of majors such as digital logic, computer composition principle and Computer Organization and Architecture.

1. To master digital logic basic theoretical knowledge and use schematic diagram method to scheme out basic combinational circuits and basic timing circuit on the EDA platform

2. To learn the basic principle and structure of FPGA device. To be familiar with the EDA software development environment, hardware description language and the use of EDA experimental station

3. To master the basic knowledge of computer composition principle. To be familiar with the working principle of computer basic parts and basic model.

Course	Operating System Experiment		
Course No.	0920311	Semester-open	5
Total Hours	32	Total Credits	2
Brief Introduction to Course			
Operating system experiment is a component of the operating system course teaching. The goals are to let the students understand the computer operating system how to allocate the CPU concurrent process; How to use the page allocation of storage management scheme for distribution management of memory and virtual memory; How to avoid multiple concurrent processes produce deadlock due to share system resources. These goals will be obtained through the simulation experiments of "Process schedule", "deadlock", "memory management" and "file system". Based on these experiments, students can understand well the process scheduling, deadlock prevention and avoidance, memory management and file management of operating system.			

Course	Digital Media Technology and Art		
Course No.	0920215	Semester-open	6
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			
Digital Media Technology and Art is the key course in digital new media technology. This course focuses on digital technology, multimedia technology and network technology, designed to provide its students with comprehensive knowledge and a core set of skills relevant to careers in digital media technology and in digital media-related research (e.g. information communication). Students will be involved in the development of digital media technology and large-scale software systems of it with interdisciplinary basic theory, basic technique, fundamental collaboration, computer science, multimedia design software characteristics and basic operation.			

Course	Character Design		
Course No.	0920214	Semester-open	5
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			
Character Design is the key course in digital new media technology. The course is intended for students technically design capability and making capability on character modeling. Students will be involved in the development of 2D/3D comic, game character design and making technology through the teaching for freehand sketching and the training for software application. This course is designed to provide its students with comprehensive knowledge and a core set of skills relevant to careers in character design and character-making. The aim is to complete graphic cartoon, character illustration, comic, game character and film character independently. Prospective students should have the capability of creative character construct and acute character observation and character analysis.			

Course	Scene Design		
Course No.	0920213	Semester-open	5
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			
Scene is the specific space environment that can unfold drama, show the living space of character and historical background, shape and foil the character image, personality traits and inward world. Scene Design is the key course in digital new media technology, and the required course of cartoon and game production. It includes 2D/3D scene design. Students will master the basic technologies and performance methods of scene design through the teaching for freehand sketching and the training for software application. This course can cultivate students' appreciation and creation capability for modeling, color, light and space of landscape, and lay a good foundation for the cartoon and game production.			

Course	Digital Image Processing		
Course No.	0920210	Semester-open	5
Total Hours	40	Total Credits	2.0
Brief Introduction to Course			

Visual information plays an important role in almost all areas of our life. Today, much of this information is represented and processed digitally. Digital image processing is widely used in every respect including multimedia technology and animation creation.

The curse offers introduction on basic concepts and approaches on digital image processing, which includes image enhancement both in space and frequency domain, image restoration, color image processing, image compression, image segmentation and other image processing techniques. By learning this curse the students can master basic concepts and approaches and achieve the ability to develop algorithms in image processing.

Course	Java Programming		
Course No.	0920122	Semester-open	2
Total Hours	48	Total Credits	2
Brief Introduction to Course			
Java language is an important tool for software development. It is a compulsory course for software engineering student. The course introduces the basic knowledge of java language. Students can master the basic syntax of java, method of object-oriented programming by the course, understand GUI programming and multi-thread method. And also master database access, web application design. Training student's idea and development of object-oriented programming.			

Course	Case Teaching of Software Ⅰ(Bilingual or English)		
Course No.	0920120	Semester-open	6
Total Hours	3 weeks	Total Credits	3
Brief Introduction to Course			
This course is intended to deepen the understanding of the students to normative software development process, specifications, documents and code writing, through the analysis of real software development cases that were developed according to the software development specifications. It exemplifies software projects in several development fields, practicing mainline as various design documents and original codes of software projects, in order to strengthen the understanding and mastering of the students to normative software development.			

Course	Software Project Management and CMM		
Course No.	0920119	Semester-open	6
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			

Software project management is the course which is opened for our undergraduates, trains some software project managers. The pursuant thing is that it could guarantee to the successful completion of a project of software development in the most reasonable, the most effective, and the most economical means .Making Introductions to the projects which consist in the field of Software project management , and they are the project planning, the estimating of cost and scheduling; the project management tools; the influencing factors of productivity and success; the measure of the birth rate ;the analysis and risk analysis; the changeable plan; the expectation management; the management of software release and configuration; the standards of Software process and their implementation; Software's contract and intellectual property rights; the maintenance methods and long-term approach of software studies development; the studies of industrial project case and so on.

Course	System Design and Analysis		
Course No.	0920118	Semester-open	5
Total Hours	40	Total Credits	2
Brief Introduction to Course			
To make the students have a comprehensive understanding of the basic concepts, theories, methods and techniques on the information system in the base of the Software engineering , the object-oriented technology, and many other courses. Systematically introduce the planning , development , maintenance and management of the construction of information system. Highlight the development work of information system which include the business analysis , the demand analysis ,the design of system the implementation of system and the test of system and so on			

Course	Software Quality Assurance and Testing		
Course No.	0920117	Semester-open	5
Total Hours	48	Total Credits	2
Brief Introduction to Course			
This course mainly introduces the basic concepts, aims strategies, stands and tools etc. of the software quality assurance and software testing. The whole curriculum consists of three sections, i.e. the principle, technology and practice of software testing, including how to guarantee and validate the quality, how to avoid errors and other quality problems; Check and review; Testing, verification and validation techniques; Process guarantees and product assurance; Quality process standards; Product and process assurance; Problem analysis and reporting, etc.			

Course	Software Design and Architecture		
Course No.	0920116	Semester-open	5
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			

This course teaches the fundamental design principles of object-oriented reusable designs. The purpose is to enable the students understand the basic design techniques and thinking methods of object-oriented designs. After the study of several classic design patterns, the students will understand how the highly-cohesive, loosely- coupled requirement of software engineering is realized by real object-oriented design and are able to design the architectures of software employing the modeling languages of OMT and UML and know how to implement the architecture with codes.

Course	Software Modeling with UML		
Course No.	0920115	Semester-open	5
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			

In this course, the students will learn how to produce detailed object models and designs from system requirements; use the modeling concepts provided by UML; identify use cases and expand them into full behavioral designs; expand the analysis into a design ready for implementation and construct designs that are reliable. The course begins with an overview of the object oriented analysis and design. Considering four views of a typical system - user, static, dynamic and implementation, each of the nine UML diagrams are discussed extensively for modeling these views. The following topics are presented: (i)use cases for modeling requirements, (ii) class and object diagrams for obtaining good understanding of an application domain and (iii) sequence, collaboration and state-chart diagrams for analyzing requirements and specifying architectural and design decisions. In addition, the course teaches the best practices in OOAD based on architectural and design patterns and how UML can be used in the context of the Unified Process (UP). It concludes with a comparative analysis of some popular UML tools.

Course	Software Requirement		
Course No.	0920114	Semester-open	4
Total Hours	40	Total Credits	2
Brief Introduction to Course			

Software requirements analysis is an important part of software engineering. It is an important impact on the success or failure for software development projects. The course aim is to introduce the basic theories and methods of Software Requirements. Developing the student ability in computer software science and software engineering practices is required. Requirement background and basic knowledge are detailed stated in the course. It focuses on the comprehensive use of analysis technology, and describes the basic activities of the requirements engineering.

Course	Software Engineering		
Course No.	0920113	Semester-open	4
Total Hours	36	Total Credits	1.5
Brief Introduction to Course			
The purpose of this course is to foster students' abilities of engaging in development of large software, especially the abilities in development of object-oriented systems, and the abilities of software testing and management from the view of engineering. The course will enable the students know the processes, fundamental methods, developing skills and tools of software development; the trends of development in various fields of software engineering; and the processes,criteria, standards and specifications that should be followed during the processes of the development.			

Course	Object-Oriented Programming		
Course No.	0920112	Semester-open	4
Total Hours	80	Total Credits	4.0
Brief Introduction to Course			
Object-oriented programming is a very practical course. Through learning the basic concepts and techniques of object-oriented, students should understand the design ideas and important contents of object-oriented, grasp the programming methods, and have the ability to develop application software. After the course study, students should understand and grasp the contents, they should be able to grasp the basic concepts of object-oriented, understand the design ideas of object-oriented, master the design process of object-oriented and have ability to program application software using object-oriented programming.			

Course	Fundamentals of Computer Programming		
Course No.	0920111	Semester-open	1
Total Hours	60	Total Credits	3
Brief Introduction to Course			

This course is the first professional basic course for students of software engineering major. There are two main aspects on the content of course.

1. This course will introduce the grammar rules and usages of C language.

2. This course will introduce the design methods for structured program.

Students will master the basic ideas, concepts and methods for programming through study this course. Meanwhile, students will be familiar with the usual algorithms and programming skills, and analyze general issues and programs through the learned knowledge and skills to write efficient C language applications. This course can make students have programming logic and the capability to solve practical problems, and lay a solid foundation for students' further learning and software development.

This course has strong practicality, and requires students to get the basic training for programming through study C language. Meanwhile, this course can make students write, debug and run programs by themselves. This course focuses on students' capability of theory and practice, cultivates students' interest in programming, and stimulates students' innovation capability.

The teaching goals of this course are shown as follows.

1. Students can master the basic grammar of C language.

2. Students can master programming ideas and basic methods.

3. Students can master usual algorithms.

4. Students have preliminary programming capability for high-level language.

Course	Computer Organization and Architecture		
Course No.	0920105	Semester-open	3
Total Hours	72	Total Credits	3
Brief Introduction to Course			
This course is one which is combined with many computer-hardware basic and specialized courses.By studying this course,the students master the basic structure and working principle of the computer,thus the computer-hardware system can be fully understood.Teachers introduce the internal structure of the CPU,the concept and roles of combinational logic and sequential logic,hierarchical memory system,instruction system, addressing mode, microprogramming, interrupt, input and output, water-like treatment system in detail. This course let the students understand the computer's basic principle and internal operation mechanism and also raise the awareness of finding various of feasible ways to improve the performance of computer in components,hardware and software through the way of teaching students working principle, composition and system structure of the computer.After studying this course,the ability is trained and cultivated which can be used in basic methods of designing and application,problem analysis and solving in computer-hardware. Students are not only required to fully grasp basic hardware composition and working principle of the computer, but also can analysis the performance of computer architecture,to have a good performance in engineering quality and innovation ability when they work in the real.			

Course	Discrete Mathematics		
Course No.	0920104	Semester-open	2
Total Hours	72	Total Credits	3
Brief Introduction to Course			

Discrete mathematics is the study of discrete structures and a branch of mathematics. As the basic theory and core course of computer science and technology, it is applied to many fields and the pre-course of other courses. Learning this course can know well about the tools and methods to dealing with discrete structures and improve the ability of abstract thinking and strict logic reasoning.

It includes mathematical logic, set theory, graph theory and algebra.

Course	Intellectual Property Law		
Course No.	0920103	Semester-open	6
Total Hours	24	Total Credits	1
Brief Introduction to Course			

This major course is designed for students without law background. The important task of the intellectual law is to acquire and protect the right to the intellectual property and it is also the important topic of the development of market-oriented economy. The content of this course includes description of intellectual property law, trademark, patent, copyright and relevant content of the modern competitive law.

The purpose of this course is to make students fully grasp the basic theory of the intellectual property law in our country by learning this course and apply their knowledge to use, so the legitimate right and interest can be guarded and the fair competitive order of the market can be kept, too.

Students are required understanding the origin and development of the legal system of intellectual property right, making tasks and function of intellectual property law clear, knowing the basic principles and features of intellectual property law, mastering trademark, patent, copyright, and the related content of the modern competitive law and analyzing and solving problems arose from various intellectual property issues in practice after integrating their theory with practice.

Course Name	Computer Professional Ethics		
Course Code	0920102	Semester-open	4
Total Hours	24	Total Credits	1
Brief Introduction to Course			

Computer Professional Ethics is a professional basic course of School of Software for undergraduate teaching. This course is designed for sophomores. The course mainly contains Computer Occupation and Moral Obligation, Computer Intellectual Property Right, Network Privacy and Freedom, Computer Information Security and Social Problems, as well as Computer Crime. This course aims to help students understanding of the relative fields of information technology about basic culture, laws and moral and other matters. Through the study of this course, students are required to understand responsibility and work ethics of computer workers, and correctly analyze and evaluate how the information technology impact on occupation and social.

Course	Introduction to Software Engineering		
Course No.	0920101	Semester-open	1
Total Hours	24	Total Credits	1
Brief Introduction to Course			
This course provides a preliminary introduction to computer science for freshman of the major. It will enable them get a comprehensive view of computer science. They will get clear concepts about fundamental knowledge of computer, Von Neumann architecture, data structure, operating systems, database, software engineering, computer network and know clearly about the history, current status and development trends of computers.			

Course	College Japanese Ⅰ		
Course No.	0920001	Semester-open	4
Total Hours	48	Total Credits	3
Brief Introduction to Course			
The course is a compulsory major course。It stands from the perspective of Chinese learning English and makes it systematic and easy for learners to learn standard，native and beautiful Japanese. The course also pays attention to the training of the language basis and puts emphasis on the development of the ability of listening and speaking. It chooses the sentence patterns, grammar and vocabularies selectively, following with detailed illustration and exercises, and attaches importance to maintenance of a high level of accuracy and scientific nature at the same time. In addition, the textbook also include the appropriate informative materials associated with Japanese language and culture, so as to expand students' vision, stimulate their study interest, and make students use Japanese as a tool so that they can serve for their major better.			

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			
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. This course is given at the beginning of the fall semester of each year and its form is group training on the campus.			

Course	Outline of Chinese Modern History		
Course No.	0913129	Semester-open	2
Total Hours	32	Total Credits	2
Brief Introduction to Course			

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.

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.

Course	Ideological and Moral Cultivation and Legal Basic		
Course No.	0913123	Semester-open	1
Total Hours	48	Total Credits	3
Brief Introduction to Course			

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.

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.

Course	Introduction to Basic Principle of Marxism		
Course No.	0913111	Semester-open	3
Total Hours	48	Total Credits	3
Brief Introduction to Course			

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.

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.

Course	Probability and Statistics		
Course No.	0911008	Semester-open	2
Total Hours	64	Total Credits	4
Brief Introduction to Course			

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.

Course	Linear Algebra and Analytic Geometry A		
Course No.	0911006	Semester-open	1
Total Hours	72	Total Credits	4.5
Brief Introduction to Course			

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.

Course	Management B		
Course No.	0909230	Semester-open	1
Total Hours	24	Total Credits	1.5
Brief Introduction to Course			
Through this course, students will master numerous scientific theories of management, know he main contents of modern management and get familiar with he 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 indispensible methods and ideas required for long-term study and development in future.			

Course	Fundamental of Electronic Engineering Circuit		
Course No.	0908001	Semester-open	3
Total Hours	64	Total Credits	4

Brief Introduction to Course

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.

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.

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:

- 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.

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.

Course	Fundamentals of Engineering Graphics		
Course No.	0907011	Semester-open	3
Total Hours	40	Total Credits	2.5
Brief Introduction to Course			

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.

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.

Course	Computer Network Experiment		
Course No.	0906554	Semester-open	5
Total Hours	16	Total Credits	12
Brief Introduction to Course			
Master the basic principles of the underlying medium and the device of data link layer and network layer and the network organizing method of the computer network through experiments, deepen the understanding of the basic principles of the computer network layer protocols through experiments, master the use of the common used network operating system and application services through experiments, exercise the students' ability of network programming through the network programming experiments, cultivate students' ability of application, analysis and designing in the computer network.			

Course	Experiments of Data Structure and Programming		
Course No.	0906550	Semester-open	4
Total Hours	32	Total Credits	1
Brief Introduction to Course			

Through experiment it can make the students to further study and master the basic concepts of object-oriented, the design thought of object-oriented program development, the characteristics of the commonly used data structure and its implementation. It also can help the students comprehend and master data structures, the choice of storage structure and algorithm design skills, master the thinking method and the basic research methods and experimental skills of computer science. It can cultivate students' innovation ability, improve students' ability to analyze and solve problems. It provides students with the necessary skills training, so it can achieve a deeper understanding and mastery of object-oriented programming and data structures course content.

Course	Computer Graphics		
Course No.	0906518	Semester-open	7
Total Hours	40	Total Credits	2
Brief Introduction to Course			
The course of Computer Graphics provides an introduction of basic principles on how to generate graphic objects by computers. The topics include: generation of basic graphic elements, space transformation and 3-D object projection, creation of curves and curved surfaces, geometric modeling, hidden surface and lighting models, etc. By learning this curse, the students can master the basic concepts, algorithms and other approaches on computer graphics, which lay the foundation to work on applications, designs and researches on CAD, CAM, and CIMS, multimedia, animation and other domains in computer graphics.			

Course	Compiler Construction Principlese		
Course No.	0906516	Semester-open	6
Total Hours	56	Total Credits	2
Brief Introduction to Course			

The course of Principles and Techniques of Compilers includes two sections: principles of a compiler and design and implementation of a compiler. The section of principles of a compiler is allocated 36 class hours, the content includes: construction of a compiler, lexical analysis, top-down syntax analysis, semantic analysis, generation of intermediate code, allocation and management of storage, organization and management of symbol tables, generation and optimization of codes, etc.. The section of design and implementation of a compiler is allocated 20 class hours, the students are required to design and implement a lexical analyzer and a syntax analyzer as well as the combination of them.

Course	Design and Analysis of Algorithm		
Course No.	0906512	Semester-open	5
Total Hours	40	Total Credits	2
Brief Introduction to Course			
Starting from the basic methods and principles of the algorithm complexity analysis, this course teaches the basic methods and principles of algorithm design, algorithm optimization methods and techniques. Through the typical problems, the corresponding algorithms and algorithmic complexity analysis, this course open the students ideas of algorithm design and analysis, activate students ideological and practical ability and train students to solve problems.			

Course	Computer Network		
Course No.	0906507	Semester-open	6
Total Hours	48	Total Credits	2
Brief Introduction to Course			

Computer Network course is one of the important lessons in major of Computer Science and Technology. It combines the technology of computer and communication to achieve long-distance information conduction and more resources to be shared. It has functions like data transmission and disposition, achieving resource share within network system. It becomes the technology that must be learned and applied for people who are engaged in production, scientific research, teaching, management, business and social activities in the information society. It requires students to lay the foundation of Computer Network in the undergraduate teaching period to satisfy the societies needs for computer network talent. It specifically includes:

1. Understand and grasp the basic composition, structure, principle, communication protocols, realization and applications of computer network.

2. Master the content of this course accurately. It is an application technology related closely with practical application, however cannot be learned as an engineering guidance. Computer network cannot be separated from a variety of protocols and standards, while it cannot be limited to these neither.

3. In the teaching process, it requires students to grasp problems to be solved in data communication, and then make sense of how these problems are solved by communication protocols. The unification of function and protocols design must be understood. Grasp the main points of the protocol engineering.

4. Lay the foundation for future network integration and software development.

Course	Database Principles		
Course No.	0906506	Semester-open	5
Total Hours	48	Total Credits	2
Brief Introduction to Course			
"Database Principles" is a fundamental specialized course. The course includes the basic concepts and principles of database systems, focuses on the principles and design of the currently popular relational database systems and structured query language(SQL). Through learning this course, students should understand the basic concepts of the database, the essential theories, methods and techniques to master the use of the theory of relational database design and management database system by SQL. The students could grasp the technology which can be used for further study and development of relevant database application system.			

Course	Operating Systems		
Course No.	0906505	Semester-open	5
Total Hours	54	Total Credits	2
Brief Introduction to Course			

An operating system is one of the most important system software in a modern computer, its function is to unify the scheduling and management of a computer system, to offer a variety of powerful system services, to create a flexible and convenient service environment for users. Through the study of operating system course, the students could be cultivated to master more solid basic theoretical knowledge of a computer, to understand and master the process management, memory management, I/O device management, file management in a computer system, so as to better understand the principle of work for operating systems and system software, to master the thinking method of computing and the basic research methods and experimental skills of computer science, to thoroughly understand the characteristics, principles and realization methods of different computer resource management from system software, further develop the ability of the system software design. Through the study of operating systems, not only is solid foundation laid for the courses such as Computer Organization, Software Engineering, principles of compilers and other related specialized courses but also the students' abilities of computing thinking, algorithm design and analysis as well as implementation, and the abilities of cognition, analysis, design and application for computer hardware and software system are developped.

Course	Data Structure		
Course No.	0906502	Semester-open	4
Total Hours	64	Total Credits	2.5
Brief Introduction to Course			

Data structure is a technical fundamental course. It has dual characters of science and technology. It is not only the basis of follow-up courses in professional study of major of Computer Science and Technology, but also directly serves to computer science and technology. It can solve the practical problems in computer system. Through the study of data structure course, the students it can be trained to have a clear basic concept of the logical structure of data structure and storage structure, the necessary basic knowledge. The students are skilled in the abilities of reading and understanding in defining basic operations on data structures. It can help the students learn to analyze and study the properties of computer processing and data structure, so that they can select the appropriate logical structure and storage structure for the data applications involve, and can write a proper corresponding algorithm.

Course	Color		
Course No.	09203(01-02)	Semester-open	2、4
Total Hours	60	Total Credits	2.5
Brief Introduction to Course			
Color is the professional basic course that can cultivate students' cognitive capability for object and spatial color. It is the key course in digital new media technology. This course can cultivate students' perception capability for color through the teaching for basic color knowledge and the training for color performance methods. Students will master the basic color performance for object, scenery, space and so on. This course can make students have preliminary understanding for natural landscape, the color properties of object and temperature relation, and have certain understanding for color harmony and color assortment. Students will have certain color sketch and color creation capability through study, so that improve their aesthetic capability.			

Course	Sketching		
Course No.	09202(01-02)	Semester-open	1、3
Total Hours	60	Total Credits	2.5
Brief Introduction to Course			
Sketching is the foundation of all plastic arts, the key course in digital new media technology. This course makes students master the basic knowledge and performance methods of sketch through the teaching for sketch theory and the training for sketch practice. Students will master the sketch methods for geometric shapes, still life, plaster model, figure and so on. Following the principles of scientific, pertinence and practicality, in order to improve the modeling capability of students as the goal, this course can cultivate students' healthy aesthetic taste, appreciation capability, basic modeling capability and perceptual skill for art.			

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			

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.

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.

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

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.

Teaching basic requirements:

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			
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.			

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

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.

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.

The specific task of this course is to:

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.

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.

2）Master the measurement method of fundamental physical quantity.

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.

4）Know the performance of general experimental instruments and can use it correctly. Understand the modern physical techniques used in modern scientific research and

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

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.

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.

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.