Bachelor Program of Electronic Information Engineering

（in English）

“电子信息工程专业”本科培养方案（英文授课）

(This document is the text compression version of the same major taught in Chinese and only for international students)

School of Electronic Information Engineering & International School

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北京航空航天大学电子信息工程学院 & 国际学院

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一、 专业简介

I. Major Introduction

信息科学和技术的发展对人类进步和社会发展产生了重大的影响，信息产业的迅速发展，已经成为经济增长和社会发展的关键要素。电子信息类专业是伴随着电子、通信、信息和光电子技术的发展而建立，以数学、物理和信息论为基础，以电子、光子和信息相结合的元器件以及电子工程、通信系统和信息网络为研究对象，从元器件到系统，从网络到服务，基础理论完备，专业内涵丰富，应用领域广泛，发展极为迅速，是推动信息产业发展和提升传统产业的基础专业之一。

The blossom of information science and technology has a significant influence on human progress and social development. Electronic Information major is set up accompanied by the development of electronic, communication, information and the photo-electronic technology, based on mathematics, physics and information theory. It regards components combining electron, photon and information as well as electronic engineering, communication system and information network as research objects. The major features complete theory basis, rich professional connotation and broad application fields from components to system, from network to service. With a rapid development, it’s one of the basic majors that boost the development of information industry and promote the traditional industry.

电子信息类专业的主干学科是包含信息与通信工程、电子科学与技术、光学工程，相关学科包括计算机科学与技术、控制科学与工程、仪器科学与技术、交通运输等，相关专业包括计算机类、自动化类、电气类、仪器类、交通类等专业。电子信息类专业是具有理工融合特点的专业，主要包括信息与通信工程、电子科学与技术、光学工程学科领域的基础理论、工程设计和系统实现技术。

The main subjects of Electronic Information major include information and communication engineering, electronic science and technology and optical engineering, its related disciplines cover computer science and technology, control science and engineering, instrument science and technology, transportation, etc... Majors such as computer, automation, electric, instruments, traffic are all related to it. Featuring an integration of science and engineering, Electronic and Information major includes information and communication engineering, electronic science and technology, as well as basic theory, project design and system implementation technologies in the field of optical engineering discipline.

二、 培养目标

II. Educational Objectives

针对留学生的教育背景、认知特点及发展需求，培养具有扎实的自然科学基础知识和必备的专业知识，具有良好的学习能力、实践能力、专业能力、创新能力，团队合作精神与国际视野，具备从事各种电子信息系统、设备和器件的研究、设计、开发、制造、维护、管理等工作的高级人才。

Based on the education background and cognitive feature development need of oversea students, our Electronic Information Sciences are committed to developing advanced talents that have a solid grasp of natural science basics and essential expertise; possess good ability in learning, practice, specialty and innovation, as well as team spirit and international outlook; are engaged in a variety of works including studying, designing, developing, manufacturing, maintaining and managing electronic information systems, equipment and devices.

三、 毕业要求

III. Degree Requirements

来华留学生应具有一定的基础汉语水平，了解中国法律法规、传统文化和风俗习惯等，热爱母校，亲华、知华、优华。

Foreign students should have some basic level of Chinese language, understanding Chinese laws and regulations, traditional culture and customs, etc., loving alma mater, knowing China and loving China.

在专业方面，能够将数学、自然科学、工程基础和电子信息专业知识用于解决复杂工程问题；能够设计针对电子信息类复杂工程问题的解决方案，设计满足特定需求的系统、单元（部件）或工艺流程，并能够在设计环节中体现创新意识；能够基于科学原理并采用科学方法对电子信息类复杂工程问题进行研究；能够针对电子信息类复杂工程问题开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具；能够基于电子信息工程相关背景知识进行合理分析，评价专业工程实践和复杂工程问题解决方案；具有人文社会科学素养、社会责任感，能够在电子信息工程实践中理解并遵守工程职业道德和规范；能够就电子信息类复杂工程问题与业界同行及社会公众进行有效沟通和交流，并具备较强的国际视野，能够在跨文化背景下进行沟通和交流。

The students should have the ability to solve complex engineering problems by mathematics, natural sciences, engineering, electronic information knowledge, to design the solutions for complex electronic information engineering problems, to design the system, unit (parts) or process to meet the specific needs, to reflect the sense of innovation in the design phase, to use scientific methods in research of complex electronic information engineering problems based on scientific principles, to develop choose and use appropriate technology, resources, modern engineering tools and IT tools for complex electronic information engineering problems, to analyze and evaluate professional engineering practice and solutions to complex engineering problems based on relative background knowledge of electronic engineering, to understand and comply professional ethics and norms with humanities and social science literacy, social

responsibility in electronic engineering practice, to communicate and exchange complex engineering problems with industry peers and the public effectively, and to communicate and exchange in a cross-cultural context with a strong international view.

四、 学制、学位

IV. Study Period

学制：四年

Study Period：4 Years， Maximum: 6 Years (not including military service time)

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

五、 专业特色

V. Characteristics

本专业按电子信息工程大类培养“学术型与工程型相结合”的宽口径人才。本专业重视未来高水平人才所应具有的人文素养，强化数理知识及学科基础理论，秉承“寓教于研”的办学理念，依托学校、学院优势课程、实验教学平台、科学研究平台与师资队伍，联合航空航天、通信电子领域的大型企业，注重系统级知识体系的培养，鼓励学生跨专业跨学科学习。

The program of Electronic Information Engineering trains "Academic and Engineering combined" talents with the wide caliber. The program focuses on importance of the humanities, mathematical knowledge and basic theory for disciplines in future high-level professional people. Adhering to the "instruction in research" philosophy and relying on advantage curriculums of university and school, experimental teaching platform, scientific research platform and joint large aerospace, aviation and electronic communications enterprises, the program pays attention to cultivate the system level knowledge and to encourage students joining interdisciplinary learning.

六、 主干学科

VI. Main Disciplines

- 信息与通信工程
  Information and Communication Engineering
- 电子科学与技术
  Electronic Science and Technology
- 光学工程
  Optical Engineering

七、 课程体系

VII. Program Structure and Modules

共分为三个课程模块：基础课程、语言及文化课程、通识课程和专业课程。

There are three course modules: Foundation Courses, General Education (GE) Courses and Major Courses.

表 1 课程体系及各课程类别的最低学分要求示意图

Table 1 The Credit Requirement (Minimum) of each Course Type for Bachelor in Electronic Information

课程模块 Course Module	Order	课程类别 Course Type	学分 Credits
I 基础课程 Foundation Courses (FC)	A	数学与自然科学类 Mathematics and Natural Sciences (MNA)	33.0
	B	工程基础类 Engineering Fundamentals (EF)	12.0
	C	语言和文化 Language and Culture (LC)	10.0
II 通识课程 General Education Courses (GE)	D	思政类 Ideology and Politics (IP)	——
		军理类 Military Theory (MT)	——
	E	体育类 Physical Education (PE)	--
	F	核心通识课程 Core GE Courses (C-GE)	2.0
	G	一般通识 General GE Courses (G-GE)	2.0
	H	博雅类 Liberal Arts (LA)	
III 专业课程 Major Courses (MC)	I	核心专业基础课 Core Major Course (C-MC)	58.0
	J	一般专业课 General Major Course (G-MC)	
	L	专业实践课 Practical Major Course (PMC)	

基础课程模块，主要包括数学与自然科学类（如数学、物理等）、工程基础类（如机械和电子工程训练、C 语言编程等），以及语言类。其中，《汉语》和《中国概况》是来华留学英文授课本科生的必修课。通识课程模块，旨在培养和提高学生在人文、社科等方面的知识和修养。

Foundation Courses (FC) include Mathematics and Natural Sciences courses (Mathematics, Physics, etc.), Engineering Fundamentals courses (Mechanism, Electronics Engineering, C language, etc.). Language courses include Chinese courses for oversea student studied in China. General Education courses are courses to improve knowledge and cultivation in humanities and social sciences.

博雅类主要含暑期学校和社会实践。

Liberal Arts (LA) mainly include summer school course and social practice course.

专业课程模块，分为专业基础课程、实践课程（含毕业设计）、专业核心课程以及一般专业选修课程。学生可根据个人的兴趣及发展方向，在学业指导老师的指导下学习。

Major courses are divided into Fundamental Major Course, Major-oriented Course, General Major Courses and Practical Major Courses (including Graduation Project). The students can select based on their own interest and direction under the guidance of school academic advisors.

八、 主要课程

VIII. Main Major courses

电路分析、电子电路Ⅰ、电磁场理论、信号与系统、微波技术、电子电路Ⅱ、数字电路与系统、数字信号处理、随机过程理论、通信原理、信息论基础、自动控制原理

Circuit analysis, Electronic circuit I, Electromagnetic field theory, Signal and systems, Microwave technology, Electronic circuit II, Digital circuit and system, Digital signal processing, Stochastic process theory, Communication principles, Information theory fundamental, Automatic control principle.

九、 主要实践教学环节及安排

IX. Main Internship and Practical (Including experiments)

表 2 实践课程清单

Table 2 Practical Courses

序号 No.	课程名称 Course Title	课程类别 Course Type	开课学期 Semester	学分 Credits	总学时 Hours
1	机械工程技术训练 A Mechanical Technology Practice A	EF	2	3.0	140
2	基础物理实验 B (1) Fundamental Physics Experiments B (1)	MNA	3	2.0	32
3	基础物理实验 B (2) Fundamental Physics Experiments B (2)	MNA	4	2.0	32
4	电子工程技术训练 Electronic Technology Practice	EF	4	2.0	64
5	模拟电路技术实践 Basic Practice on Electrical Technology Ⅰ	EF	4	1.0	32
6	数字电路技术实践 Basic Practice on Electrical Technology Ⅱ	EF	5	1.0	32
7	社会实践 Social Practice	LA	6	1.0	16
8	综合创新系列-综合设计 Comprehensive Innovation- Comprehensive Design	PMC	6	2.0	32
9	生产实习 Production Practical	PMC	6.5	3.0	3 weeks

序号 No.	课程名称 Course Title	课程类别 Course Type	开课学期 Semester	学分 Credits	总学时 Hours
10	毕业设计 Graduation Project	PMC	7-8	8.0	16weeks

十、 毕业最低学分

X. Minimum Required for Graduation

毕业最低学分要求：在满足各课程类别最低学分的要求下，总学分不低于 125 学分。

Minimum Required for Graduation=125 credits, and meet the credit requirement of each Course Type at the same time.

十一、 教学进程计划

XI. Education Curriculum

the 1st Semester

Code	Title	Hours	Credits	Note	Course Type	Evaluation
A09A101I	工科高等数学 (1) Advanced Mathematics for Engineering (1)	90	6.0	Compulsory	MNA	Examination
B25D111I	中国概况 Introduction to China	32	2.0	Compulsory	LC	Examination
B1C251131L	汉语 (1) Chinese (1)	64	4.0	Compulsory	LC	Examination
C05D101I	航空航天概论 B Introduction to Aeronautics and Astronautics B	32	2.0	Compulsory	C-GE	Examination
C06D101I	大学计算机基础 University Computer Foundation	44	2.0	Compulsory	G-GE	Examination
C32D101I	工程认识 Engineering Experience and Cognition	20	0.5	Compulsory	EF	Examination
E02D111I	电子信息工程导论 Introduction to Electronic Information Engineering	16	1.0	Compulsory	EF	Examination
	学期学分小计 Semester Credits		17.5			

the 2nd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09A102I	工科高等数学 (2) Advanced Mathematics (2)	86	5.0	Compulsory	MNA	Examination
A19A101I	工科大学物理 (1) University Physics for Engineering (1)	64	4.0	Compulsory	MNA	Examination
B1C251141L	汉语 (2) Chinese (2)	64	4.0	Compulsory	LC	Examination
A09A103I	工科高等代数 Advanced Algebra	90	6.0	Compulsory	MNA	Examination

Code	Title	Hours	Credits	Note	Type	Evaluation
G32A201I	机械工程技术训练 A Mechanical Technology Practice A	144	3.5	Compulsory	EF	Examination
C25D121I	C 语言程序设计与实践 C Programming Language Design and Practice	32+16	2.5	Compulsory	EF	Examination
	学期学分小计 Semester Credits		25.0			

the 3rd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09B204I	概率统计 A Probability Statistics A	48	3.0	Compulsory	MNA	Examination
A09B2060	复变函数 Complex Variables	32	2.0	Compulsory	MNA	Examination
A19A202I	工科大学物理 (2) University Physics for Engineering (2)	64+16	4.0	Compulsory	MNA	Examination
A19A103I	基础物理实验 B (1) Fundamental Physics Experiments B (1)	28	1.5	Compulsory	MNA	Examination
C02D222I	计算机软件技术基础 Software Technical Fundament	48+16	3.5	Compulsory	EF	Examination
E02B231I	电路分析 Circuit Analysis	48+16	3.5	Compulsory	C-MC	Examination
	学期学分小计 Semester Credits		17.5			

the 4th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A19A104I	基础物理实验 B (2) Fundamental Physics Experiments B (2)	24	1.5	Compulsory	MNA	Examination
E02B251I	信号与系统 Signals and Systems	48+16	3.5	Compulsory	C-MC	Examination
E02B241I	电磁场理论 Electromagnetic Field Theory	48+16	3.5	Compulsory	C-MC	Examination
E02B253I	电子电路Ⅰ Analog Electronic CircuitⅠ	48+16	3.5	Compulsory	C-MC	Examination
E03A201I	模拟电路技术实验 Basic Practice on Electrical TechnologyⅠ	32	1.0	Compulsory	EF	Examination
G32A204I	电子工程技术训练 Electronic Technology Practice	64	2.0	Compulsory	EF	Examination
	学期学分小计 Semester Credits		15.0			

the 5th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E02B352I	随机过程理论 Stochastic Process	32	2.0	Compulsory	C-MC	Examination
E02B334I	数字电路与系统 Digital Circuit	48+16	3.5	Compulsory	C-MC	Examination
E02B342I	微波技术 Microwave Technology	48+16	3.5	Compulsory	C-MC	Examination
E02B333I	电子电路Ⅱ Analog Electronic CircuitsⅡ	48+16	3.5	Compulsory	C-MC	Examination

E03A302I	数字电路技术实践 Basic Practice on Electrical Technology Ⅱ	32	1.0	Compulsory	EF	Examination
	学期学分小计 Semester Credits		13.5			

the 6th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E02D362I	自动控制原理 Principle of Automatic Control	26+12	2.0	Compulsory	C-MC	Examination
E02D323I	微机原理与接口技术 Principle and Interface Technique of Microcomputer	40+16	3.0	Compulsory	EF	Examination
E02B353I	数字信号处理 Digital Signal Processing	48+16	3.5	Compulsory	C-MC	Examination
E02D354I	信息论基础 Basis of Information Theory	32	2.0	Compulsory	C-MC	Examination
B3J023930	综合创新系列-综合设计 Comprehensive Innovation- Comprehensive Design	64	2.0	Compulsory	PMC	Examination
	学期学分小计 Semester Credits		12.5			

the 7th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E02B371I	通信原理 Principle of Communication	48+16	3.5	Compulsory	C-MC	Examination
F02D414I	通信天线与馈电系统（留学生） Antennas and Feed System for Communication	32+16	2.5	Compulsory	G-MC	Examination
F02D411I	无线电导航 Radio Navigation	32	2.0	Compulsory	G-MC	Examination
	学期学分小计 Semester Credits		8.0			

the 8th Semester

	论文 Graduation Project	16weeks	8.0	Compulsory	PMC	Test

备注：

（1）只列出各学期必修课程目录

Only compulsory courses are listed

（2）课程类别的相关说明

Explanation of course type**:**

数学与自然科学类　　Mathematics and Natural Sciences (MNA)

工程基础类　　Engineering Fundamentals (EF)

语言和文化　　Language and Culture (LC)

核心通识课程　　Core GE Courses (C-GE)

一般通识	General GE Courses (G-GE)
核心专业基础课	Core Major Courses(C-MC)
一般专业课	General Major Course(G-MC)
专业实践课	Practical Major Course (PMC)

如下课程留学生可选修
Other courses student can select

Course Type	Title	Credits	Note
PE	体育课 Physical Education	0.5 Credit/Semester	International students can select from the 2nd semester.
LA	文化素质拓展 Culture Quality Developing	1.0 Credit/Semester	International students can select from the 3rd semester.
G-GE	暑期学校系列课程 Courses in Summer Camp	Max 6.0 Credits /Summer Semester	International students can select the courses in summer semester (3rd semester) during the 2nd or the 3rd academic year.
G-GE	专业英语阅读与写作 Professional English Reading and Writing	2.0 Credits/Semester	International student can select since 5th semester.
	社会实践 Social Practice	1.0 credit	
	汉语水平考试 HSK	1.0 credit	One credit will be offered if the international student passed HSK 3 or over.
	其他课程 Other Courses		See the time-table at the beginning of each semester.

十二、 联系方式

XII. Contact Detail

Address: International School, Beihang University
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Post Code: 100191
Tel: 86-10-82316488 86-10-82339165
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Web Site: http://www.buaa.edu.cn
http://is.buaa.edu.cn

Syllabus of *Higher Mathematics for Engineers (1)*

COURSE CODE: B1A091061L
COURSE TITLE: Higher Mathematics for Engineers (1)
LECTURER: YA Li
HOURS: 90
CREDITS: 6

Course Description

This course is a first course in the calculus of one variable intended for engineering major. This course mainly concentrates on the functions of one variable, which includes topics of derivatives and integrals of functions and a variety of applications of differentiation and integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Contents and Arrangements

This course covers Chapter 1-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Functions and Models
2. Limits and Derivatives
3. Differential Rules
4. Application of Differentiation
5. Integrals
6. Applications of Integration
7. Techniques of Integration

8. Further Applications of Integration
9. Differential Equations
10. Parametric Equations and Polar Coordinates

Syllabus of *Introduction to China*

COURSE CODE: B1C251221L
COURSE TITLE: Introduction to China
LECTURER: SUN Yan
HOURS: 32
CREDITS: 2

Course Characteristics

This course is tailored for foreign students who learn their undergraduate majors in English-Medium, and it is a compulsory course categorized in general courses. General speaking, owing to limit experience and mislead of medium oversea the most of the undergraduate students have fragmental, superficial, not comprehensive and even sometimes wrong on China and Chinese society. This course will not only impart comprehensive and systematical knowledge into foreign students on Chinese geography, Custom, culture, history, Education, legal system and political system , but also introduce some hot topics to foreign students for example , reform and open to outside world policy and its achievements, religion and its policy, population and its policy, as well as foreign policy and the policies toward Hang Kong, Macao and Taiwan.

Course Target and Task

This course will fulfill the students following graduation tasks: 1. They will obtain an overall, systematical and positive understanding about China. 2. Affection will be cultivated and this course will lay a foundation to foster scholars who know China, treat China as a friend and support China. 3. This course will benefit their further study and life in China and provide them with necessary knowledge and information to understand Chinese society and communicate with Chinese. So it is very important aim for this course to provide some necessary, basic, accurate and important information to foreign students in order to understand China and the Chinese well.

Topics, Lectures and Hours Distribution

This course consists of twelve topics two practices. Twice practices will make students to experience and witness Chinese culture and Chinese society personally. Detail arrangements are as follows:

1. Basic Information and national condition, including the territory administrative division, climate etc.
2. Chinese traditional festivals and customs
3. Chinese History and Confucius
4. Reform and Open to Outside World and Its Achievements
5. Education , Religion and its Policy
6. Political System and State structure
7. Legal System

8. Population and its Policy
9. Foreign Policy and the Policies Toward HK, Macao and Taiwan visiting a Museum
10. Visiting Yuan Ming Park or Great Wall

Syllabus of *Chinese (1)*

COURSE CODE: B1C251151L
COURSE TITLE: Chinese (1)
COURSE CHINESE TITLE: 汉语（1）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course is prepared for overseas students who have never learnt Chinese or those who have a command of less than 100 new words. The course is based on the study of new words and grammar, and at the same time focuses on the cultivation of listening and speaking ability. Students need to complete primary communication tasks (including confirmation, introduction, time and direction, daily needs) which help students to acquire initially comprehension and expression ability and conduct basic conversation in Chinese in daily life and school life.

The course aims to help most students to be up to HSK1 level in listening, speaking, reading and writing aspects.

Course contents

The course contents and detail arrangement are as follows:

1. The study of Pinyin (Chinese phonetic alphabet)
2. Topics about: Name& nationality, Personal belongings, Family, Class, Birthday and Date, Work and rest, School, Room, Have a meal, Shopping, Handle affairs, Means of transportation etc.

Syllabus of *Introduction to Aeronautics and Astronautics (B)*

COURSE CODE: B2F050121L
COURSE TITLE: Introduction to Aeronautics and Astronautics（B）
RESPONSIBILITY PROFESSOR: YANG Chao, JIA Yuhong
SEMESTER: Fall/Spring
CREDITS: 2
HOURS: 26

Course Description

《The Introduction of Aeronautics and Astronautics》is a required course for the students of first year in the university. It is about basic knowledge, basic principles and development situation of aeronautics and astronautics technology. The learning of this course can stimulate the learning interest of students and improve the understanding for basic contents of aeronautics and astronautics technology.

Course Objective

The learning purpose of this course is to learn about the general development situation, basic concepts, basic knowledge of aeronautics and astronautics field, and learn about the position and function of learning specialty in aeronautics and astronautics technology.

1. Knowledge ability
2. Ability to explore problems and solve problems
3. Ability of leadership and guidance
4. Consciousness of morality and service
5. Enhance international view

Course Contents

1. General development situation of aeronautics and astronautics
2. Flight environment and flight principles
3. Energy power system of flight vehicle
4. Airborne equipments of flight vehicle
5. Flight vehicle structure

Syllabus of *University Computer Foundation*

COURSE CODE: B1B061011L
COURSE TITLE: University Computer Foundation (International College)
COURSE CHINESE TITLE: 大学计算机基础
RESPONSIBILITY PROFESSOR: CAO Qinghua
CREDITS: 2
HOURS: 44 (26 Hours in class +18Hours for experiments)

The Nature, Purpose, and Goals of this Subject

This course is a basic course for students majoring in computer science. The arrangement of the course uses the method of combining theory and practice, the key to help students master the basic skills of computer, practical operation and comprehensive application, and then improve the students' ability to analyze problems and solve problems.

The teaching of this course and the computer experiment, students should meet the basic requirements including: the basic concepts of computer, computer basic knowledge and principle, network knowledge and multimedia application technology. The general objectives for this course can be divided into the following:

1. The development of computer, new technology and modern information technology.

2. Master the conversion between carry counting system and number system method, and method of data in the computer.
3. Master computer system components and working principle.
4. Comprehensive application of common office software.
5. Basic knowledge and application of computer network.
6. Understand the concept of information security.
7. Concept and application of multimedia.
8. In accordance with the requirements, Cooperative writing papers and submit.

Course Contents

1. Computer Basic Knowledge
2. Computer System
3. Office Software
4. Computer Network
5. Information Security And Morality
6. Multimedia Technology Foundation
7. Comprehensive

Syllabus of *Engineering Knowing*

COURSE CODE: B1B321011L
COURSE TITLE: Engineering Knowing
COURSE CHINESE TITLE: 工程认识实习
LECTURER: MA Pengju
HOURS: 16
CREDITS: 1

The Text of the Course Outline

To describe the definition and connotation of subject terms of the course title;
Engineering Knowing is the first level of engineering training in the core courses of the school management. Through the summary and introduction of engineering materials, machinery manufacturing, electrical and electronic technology, testing technology, and mechanical and electrical integrated and industrial control and combination of the typical manufacturing processes, the visit of equipment and typical practice of application cases, students are enabled to have a understanding of the general picture on the above-mentioned industrial and technical fields, in order to cultivate them with preliminary engineering consciousness and practice ability.

To describe the status, characteristics and the main content of the course in the personnel training;
1. Students can have a preliminary acquaintance of the general structure of mechanical and electrical products, the used materials, processing technology and improve the manipulative ability through the disassembly practice of common and typical mechanical and electrical products.
2. By visiting the machinery manufacturing technology, students can have a certain understanding on the manufacturing process, used tools and equipment of machinery products. They can deepen the comprehension that science and technology constitute the primary productive force and improve the interest of mastering the knowledge and skills through the comparison of basic manufacturing technology and modern manufacturing technology.

Course Content and Basic Requirements

1. Mechanical Design and Manufacturing
   1) To understand engineering graphics and digital design;
   2) To comprehend the basic knowledge of machines (parts, components, machines, drive, materials, processing technology);
   3) To acquire the mechanical manufacturing process and equipment;
   4) To know the advanced manufacturing technology.
2. Bicycle Disassembly
   1) To acquire the basic components of a bicycle;
   2) To understand the typical mechanical structure;
3. Electrical and Electronic Technology
   1) To comprehend the generation and transmission of electric energy;
   2) To understand the circuit of the user side;
   3) To know motor control;
   4) To acquire the recognition and characteristics of electronic components;
   5) To comprehend the introduction of electronic technology.
4. Testing technology, Mechanical and Electrical Integration and Industrial Control Technology
   1) To know the sensing, non-electric power conversion, signal amplification and conditioning;
   2) To understand the instrument technology;
   3) To comprehend the introduction of electrical and mechanical transmission and control technology (including electrical engineering and fluid).

Syllabus of *Introduction to Electronics Information Engineering*

COURSE CODE: B1B021110L
OURSE TITLE: Introduction to Electronics Information Engineering
LECTURER: JIN Tian
HOURS: 18
CREDITS: 2

Course Description

This course will introduce the history and current stage of electronics Information Engineering. A branch area of electronics engineering will be introduced in each chapter. The course will cover analog electronics, digital electronics, network communication, wireless communication, navigation technology and software defined radio technology.

Course Objective

This course is the basic course of electronics engineering student. The course will introduce the history and current technology of electronics engineering. Furthermore, the subject in this class will increase the interest of students, and will help them in further course learning.

Course Contents

1. Introduction to Electronics
2. Introduction to Analog Electronics
3. Introduction to Digital Electronics

4. Introduction to Integrated Circuit
5. Introduction to Network Communication
6. Introduction to Wireless Communication
7. Introduction to Satellite Navigation
8. Introduction to Software Defined Radio

Syllabus of *Higher Mathematics for Engineers (2)*

COURSE NUMBER: B1A091071L
COURSE NAME: Higher Mathematics for Engineers (2)
LECTURER: PENG Gao
HOURS: 86
CREDITS: 5

Course Description

This course is a second course in the calculus of one variable intended for engineering major. It is designed to meet the needs of students who have completed Higher Mathematics for Engineers (1) and desire to extend their skills in this subject. This course mainly concentrates on the integral calculus. Topics include an overview of integration, basic techniques for integration, a variety of applications of integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Course Contents

This course covers Chapter 6-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Applications of Integration
2. Techniques of Integration
3. Further Applications of Integration
4. Differential Equations
5. Parametric Equations and Polar Coordinates

Syllabus of *University Physics for Engineering I, II*

COURSE CODE: B1A19101BL，B1A19201BL
COURSE TITLE: University Physics for Engineering I, II
LECTURER:
HOURS: 64
CREDITS: 4

Course Characteristics

Physics is the subject of studying the basic structure of matters, the interactions between them, and the most fundamental and universal movements of the matters and their transformations. Physics is the basis of all natural sciences. In the 2l century, physics will still be in the leading position in the developments of science and technology.

Through College Physics teaching shall guides the students to acquire a comprehensive and systematic knowledge and understanding about the basic concepts, theories and methods of physics. In addition, through College Physics teaching shall as well enable the students to have preliminary ability of applying the knowledge.

The concrete requirements of these three levels are as follows:

1. Mastery: thoroughly understand the physical contents, master the applicable conditions, and be able to use skillfully. Generally required to be able to derive formulas.
2. Understanding: Generally not required to derive formulas but be able to analyze and calculate the relevant problems.
3. Acquaintance: know about the content. Be able to give qualitative explanation and do simple calculation. Generally not required to apply.

Course Content

1. Mechanics

1) Particle kinematics
2) Newton's law
3) Work and energy
4) Impulse and momentum
5) Motion of rigid body
6) Special theory of relativity

2. Electromagnetism

1) Electrostatic field
2) Constant magnetic field
3) Electromagnetic induction
4) Electromagnetic field

3. Kinetic theory of gases and Thermodynamics

1) Kinetic theory of gases
2) Thermodynamics

4. Mechanical vibration

5. Wave and Wave Optics

1) Mechanical Wave
2) Electromagnetic Wave
3) Wave Optics

6. Modern Physical Basis

Syllabus of *Chinese (2)*

COURSE CODE: B1C251161L
COURSE TITLE: Chinese (2)
COURSE CHINESE TITLE: 汉语（2）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course aims to help overseas students who have already had a foundation of Chinese to proficiently use Chinese Pinyin and write commonly-used Chinese characters. Students are required to have a command of more than 600 common words and 60 grammar points, at the same time further improve their understanding and communicative abilities. It also helps students to lay a firm foundation to well prepare for Chinese study in second year. It requires students to use Chinese language knowledge and skills to solve basic problems in daily life and complete primary communicative tasks in the course, such as life schedule, asking for help, explanations, descriptions and comparisons. The course emphasizes the training of listening, speaking, reading and writing to improve comprehensive abilities. At the same time, it will teach students with study methods to strengthen their confidence in language learning and guide them to study by themselves.

The course aims to help most students to be up to HSK2 level in listening, speaking, reading and writing aspects.

Course contexts, tasks and study hours

The course contents and detail arrangement are as follows:

1. Daily activities
2. Weekends
3. Chinese Courses
4. Sports
5. Personal Skills

6. Direction & Distance
7. Accommodation
8. Hobbies
9. Health
10. Age, Height and Weight
11. Dress
12. Chinese study
13. Weather
14. Food
15. City
16. Event

Syllabus of *Advanced Algebra in engineering*

COURSE CODE: B1A091031L
COURSE NAME: Advanced Algebra in engineering
LECTURER : ZHAO Di ; LI Hongyi
HOURS: 64 hours lectures +16 hours drills
CREDITS: 5

COURSE DESCRIPTION

Linear Algebra is an undergraduate course. It has been introduced here as a handy tool for solving practical problems. Linear Algebra has many applications in other disciplines, such as statistics, economics, engineering, physics, biology, and business. Linear Algebra is ore useful now than at almost any time in the past. Due to the computer revolution, Linear Algebra has risen to a role of prominence in the mathematical curriculum.

COURSE OBJECTIVE

Students are asked to solve similar problems or explain the basic concepts. The study of Linear Algebra instills habits of thought that are essential for a proper understanding of many areas of pure and applied mathematics.

COURSE CONTENTS

1. Determinants
2. Matrices
3. Linear dependence of vectors
4. Linear equations
5. Similar standard form
6. Inner space and Quadratic form

Syllabus of *Mechanical Technology Practice A*

COURSE CODE: B1B322011L
COURSE NAME: Mechanical Technology Practice A
COUUSE CHINESE NAME: 机械工程技术训练（A）
LECTURER: MA Pengju
HOURS: 140 hours
CREDITS: 3.5

The Nature, Purpose and Task of the Course

Mechanical Technology Practice is an important basic technical course, which takes mechanical manufacturing as the carrier in the undergraduate college in order to cultivate students' ability of engineering practice.

1. To understand the whole technical process of production mode and machines in modern manufacturing industry from the materials, parts, to even the machines, get familiar with the main forming methods of engineering materials and the main machining methods, possess with a preliminary skill of independent operation, and lay a good foundation for the follow-up courses, graduation design, professional course design, comprehensive experiments, and extra-curricular scientific and technological practice.
2. To master the process knowledge and the knowledge of modern management in a certain extent, cultivate students' ability of engineering practice and team spirit, and improve and strengthen students' innovation consciousness and innovation ability.
3. To make the students understand and comprehend the common technology in mechanical manufacturing system through training (such as transmission technology, detection and display technology, and information synthesis and control technology, etc.), and provide a sensible understanding to the follow-up courses.
4. To carry out the ideological education, train and exercise the attitude to labor, and quality and economic concepts, strengthen students to observe labor discipline and comply with the safety rules in consciousness, and improve the overall quality of students.

Course Content, Basic Requirements and Allocation of Credit Hours

1. Practice of Heat Treatment for Surface Protection
2. Casting Practice
3. Forging and Pressing Practice
4. Welding Practice
5. Practice as the Lathe Worker
6. Active as a Miller
7. Practice as the Grinder
8. Practice as the Bench Worker
9. Practice of Wire Cut Electrical Discharge Machining
10. Laser Practice
11. Practice of Numerical Control Machining

Syllabus of *C Language Programming*

COURSE CODE: B1B021121L
COURSE NAME: C Language Programming
COURSE CHINESE NAME: C 语言程序设计
LECTURER: WANG Li-jing
HOURS: 48
CREDITS: 2.5

The Nature, Purpose and Task of the Course

1. C language is a computer language used widely at home and abroad, which has been widely applied in the development of system software and application software with its rich and flexible control and data structure, simple and efficient expressions, clear program structure, and good portability.
2. Purpose and mission is to guide students into a great potential curriculum design of computer programming, cultivate students' logical thinking ability, abstract ability and basic computer programming skills.
3. Through the study of this course, students master a high-level programming language, learn to use the C language to solve general application problems. Learn to read simple application written in a computer programming language, master the basic structured programming method and basic steps of using computers to solve practical problems, and lay a good foundation for further study of the other basic courses and professional courses. The C programming language is a very strong practical courses,which must be required through hands-on learning of knowledge, so special emphasis on combing lecture and hands-on is necessary, while make sure every student have adequate computer conditions.
4. Key skillsaccording with graduate training target in mining issues and problem-solving: training students to think independently, active discovery, analysis, design and problem solving, and have the basic research skills for engaging in aircraft design disciplines.

Course Content

1. Programming and C language
2. Algorithm-the soul of the program
3. The simplest programming -sequential programming
4. Selective structure programming
5. Cycle structure programming
6. Batch process data by using array
7. Block-based design by using function
8. Excelingat using pointer
9. Building the data type of the user
10. Input and output to the file

Syllabus of *Probability and Statistics A*

COURSE CODE: A09B204I
COURSE NAME: Probability and Statistics A
LECTURER: Mahboob Iqbal
HOURS: 48
CREDITS: 3

Course Description

This course provides an introduction to probability and statistics with engineering applications. Topics include: fundamentals of statistics; basic probability models; combinatorics; random variables; discrete and continuous probability distributions; statistical estimation and testing; confidence intervals; regression; and introduction to random processes.

Course Objective

Understand random outcomes and random information

1. Learn how handle statistical information
   1) statistical analysis
   2) model building
2. Understand probability theory
3. Learn random variables and distributions
4. Know-how of random processes

Contents and Arrangements

1. Introduction to Statistics
2. Descriptive Statistics
3. Elements of Probability
4. Random Variables
5. Special Probability Distributions
6. Distributions of Sampling Statistics
7. Statistical Estimation
8. Hypothesis Testing
9. Correlation and Regression
10. Random Processes

Syllabus of *Complex Analysis*

COURSE CODE：B1A05201B
COURSE TITLE: Complex Analysis
COURSE CHINESE TITLE：复变函数
LECTURER: CHEN Yulin
Credits: 2
Hours： 32

Course Type and Main Objectives

This course is a fundamental course in college of Engineering. It helps sophomores and juniors to further study mathematics after learning Mathematical Analysis. Studying this course, the students in engineering majors, such as aeronautics, mechanical engineering and civil engineering, can master and apply mathematical tools to prepare for the specialized courses. In this course, students are required to master the basic content of the textbooks, to complete exercises of each chapter and homework assignments independently, and to analyze specialized models by using the integrated knowledge of complex function.

This course supports the following graduation requirements:

A. Basic theory and knowledge of mathematics.

F. Basic methods of literature search and certain scientific research and practical work abilities.

Course Content

1. Introduction
2. Analytic functions
3. Complex functions integrals
4. Series
5. Residues exordium

Syllabus of *General Physics Experiment*

COURSE CODE：A19A203，A19A204
COURSE TITLE：General Physics Experiment
COURSE CHINESE TITLE：基础物理实验 B(1)(2)
LECTURER: LI Hua
Hours: 60
Credit：3.5

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It is a beginning for students to learn systematic experimental method and technology.

Students could get basic knowledge as follows: measuring method offundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on) and error evaluation of measuring result.

Course Contents

1. Measurement of metal elastic modulus
2. Measuring moment of inertia of a rigid body
3. A series of experiments on the air track
4. Digital measurement experiment
5. Thermal experiment
6. The application of the oscilloscope
7. Resistance measurement
8. Potentiometer and its applications
9. Thin lens and the focal length of a single spherical mirror measurement
10. Spectrometer adjustment and its application
11. Light interference experiment I（Partial wave surface method）
12. Light interference experiment II（Sub-amplitude method）

Syllabus of *Computer Software Technical Fundament*

COUESE CODE: C02D222I
CHOURSE TITLE: COMPUTER SOFTWARE TECHNICAL FUNDAMENT
Credits: 3.0
Hours: 48+16 hours

Teaching objectives

Through learning the course, the students should have a comprehensive understanding of the basic knowledge and skills required to design the computer software system, focused on forming a good style of programming from the beginning. Students will be enabled to have a better understanding of the application software designing principle and structure after the learning of practical software developing fundament, basic software environment knowledge, basic skills of network applications, laying a solid foundation for the future software work.

Teaching content and basic requirements

1. **Software development fundament**
   1) Fundamental knowledge
   2) Algorithm and data structure
   3) Software Engineering
2. **Software environment fundament**
   1) Operating system
   2) Relational database system
3. **Web Applications Fundaments**
   1) Overview of computer networks
   2) Network protocol and network operating system

Teaching Arrangement

1. Introduction
2. Programming language
3. Algorithm and data structure
4. Software engineering
5. Operating system
6. Relational database
7. Overview of computer network

Syllabus of *Circuit Analysis*

Course Code：E03B2010
Course title in Chinese：电路分析
Course title in English：circuit analysis(A)
Team leader：XXX
Hours/ credits：48/3

Objective

This course is an undergraduate in electromechanical important technical basic course. Through this course the students the basics of modern circuit theory and basic calculation method to master, to lay the necessary foundation for further learning relevant follow-up electrical courses. This course is for students to learn scientific thinking ability, establish a theory with practical engineering concepts and improve students analyze problems, problem-solving skills have an important role.

Course Contents

1. Circuit model and circuit Law
2. Resistive circuit equivalent transformation
3. Resistor circuit analysis
4. Circuit Theorem
5. Phasors
6. Sinusoidal steady state circuit analysis
7. Of the circuit includes a coupled inductor
8. Of the three-phase circuit
9. Non-sinusoidal Current Circuit
10. First order and second-order time-domain circuit analysis circuit
11. Laplace transform
12. Of two-port networks

Syllabus of *General Physics Experiment*

Course code：A19A203，A19A204
Course Title in Chinese：基础物理实验 B(1)(2)
Course Title in English：General Physics Experiment
Hours / Credit：3.5/60
Leader of Team：Li Hua, **Responsibility Professor：**Li Chaorong, **Writer：**Li Chaorong **Dean of School for checking：**XXX

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It is a beginning for students to learn systematic experimental method and technology.

The course of general physical experiment has various experimental ideas, methods and tools to provide comprehensive training for basic experimental technology. It is an important foundation for students to enhance scientific experimental ability and scientific accomplishment. It could not be replaced

by other practical courses for students to train their religious scientific attitude, active consciousness of innovation, comprehensive ability of connecting theory and practice, adaptability of the development of science and technology, and so forth.

Students could get basic knowledge as follows: measuring method of fundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on) and error evaluation of measuring result.

Course Contents

1. Measurement of metal elastic modulus
2. Measuring moment of inertia of a rigid body
3. A series of experiments on the air track
4. Digital measurement experiment
5. Thermal experiment
6. The application of the oscilloscope
7. Resistance measurement
8. Potentiometer and its applications
9. Thin lens and the focal length of a single spherical mirror measurement
10. Spectrometer adjustment and its application
11. Light interference experiment I（Partial wave surface method）
12. Light interference experiment II（Sub-amplitude method）

Course Syllabus of *Signals and Systems*

Course Title: Signals and Systems
Semester: Spring
Credits/Hours: 3.5/64

Course Description and Objectives

As the basic theoretical course for the research of signals and systems, this course has the major task of studying the basic concepts and analytical method of deterministic signal and linear time invariant system, which consist of analysis of time domain, frequency domain and complex frequency domain of signals and systems, paving the way for the further study of courses of communication, signals processing, control and system design. The course also has the necessary basic knowledge for research and development in concerning majors. This course served as a connecting link between the preceding and the

following among curriculum of Communication and Electric System Major. Therefore, after acquiring basic concepts, regularities and applications of the course, students should be fostered to be talents who have broad and systematic view, be able to eliminate the false and get the truth on practical problems and extract regularities, and have scientific and technological thinking.

This course, in which continuous time system and discret-time system is the mainstream, includes research on describing method, features, classification, basic laws of signals and systems from the aspect of time domain, real number transform domain, plural number transform domain, as well as solution and analysis of response of signal incentive system. The detailed contents in this course are as followed: description, classification, and solution to response of signals and systems, Fourier transform, Laplace transformation, Z transformation, forward transformation and reverse transformation of Fourier transform of discrete series, and application of analysis and incentive solution of signals and systems.

Course Contents

1. Introduction to Signals and Systems
2. Domain Analysis of Continuous Time System
3. Continuous real-time signal analysis in the frequency domain
4. Real Frequency Domain Analysis of Continuous Time System
5. Continuous Time Signals and Systems Complex Frequency Domain Analysis
6. Discrete Time Signal and System Time Domain Analysis
7. Transform Domain Analysis of Discrete-time Systems

Syllabus of *Fundamental Theory of Electromagnetic Field*

Course Number： 02j8211
Course Name (in Chinese)： 电磁场理论
Course Name (in English)： Fundamental Theory of Electromagnetic Field
Credits/ Hours： 4 /(64+8)

Course Objectives

Fundamental Theory of Electromagnetic Field is one of the main courses for students majoring in electronic engineering. The course is not only an important basis for many professional courses, but also the basis for the development and growth of many emerging interdisciplinary subjects. It studies the basic properties of matter and the laws of motion as well as the interaction between substances from the perspective of electromagnetic field. With a rigorous theory and complete system, this course is representative in terms of its uniqueness in logical reasoning, mathematical physical analysis method and the motion law of electromagnetic field.

Through the study of the course, the students are expected to get their horizon broadened and learn to observe, analyze and then solve problems from the perspective of field. As for the learning content, the students are required to master the basic properties and typical analysis methods of static and time-varying electromagnetic field. Meanwhile, they are supposed to grasp the basic rules of electromagnetic fields and get a comprehensive understanding of electromagnetic field and electromagnetic wave theory as a whole. They should also learn to analyze and calculate some typical electromagnetic boundary value from the

point of view of electromagnetic field with a macro-analysis thought, laying a solid foundation for successive courses and postgraduate study.

Course Contents and Basic Requirements

1. Course overview；vector analysis：vector line, surface element, volume element； generalized coordinates；
2. Field theory：gradient, divergence, Gauss's theorem; Laplace operator
3. Curl, Stokes's theorem, conservative fields criterion
4. Law of differential field; free space field law: four kinds of electric charge, three kinds of electric current, general physical meaning of Maxwell's law in integral form
5. General physical meaning of law of differential field; boundary condition
6. physical meaning of electrostatic scalar potential field; scalar differential equations and boundary conditions
7. scalar properties (extreme law, median law, uniqueness law), mirror method
8. electrostatic field separation of variables
9. vector potential of static magnetic field, scalar potential of static magnetic field, static magnetic scalar potential far zone multipole expansion
10. The basic concept of polarization and magnetization of matter, polarization model, two kinds of magnetization model, the law of matter field
11. Energy of electromagnetic field, static power flow and loss
12. Wave equation (1D, 3D) free space plane electromagnetic wave
13. uniform plane wave, time-harmonic field, complex field law
14. definition of polarization of electromagnetic wave
15. propagation of uniform plane wave
16. propagation of plane wave in lossy medium
17. wave in medium with high frequency
18. reflection of free space and metal interface
19. reflection and transmission of different media interface
20. interference issues
21. time varying field function
22. alternating dipole radiation field, alternating electric dipole radiation field analysis
23. alternating magnetic dipole radiation field analysis
24. aperture field radiation analysis

Syllabus of *Analog Electronic Circuit I*

COURSE CODE: 02J82150
COURSE TITLE: Analog Electronic Circuits Ⅰ
LECTURER: Zhao Qi
HOURS: 58+6
CREDITS: 4

Course Description

Electronic Circuit I is an important course of basic technology for Electronic and Telecommunication major. Through this course, students will learn about the characteristics, parameters and model of commonly used semi-conductor devices, master the composition, work principle, characteristics, basic analysis and engineering calculation methods of basic electronic circuit, and lay a solid and necessary foundation for their future study of other professional courses.

Course Objective

The subject aims to provide the student with:

1. An understanding of basic EE abstractions on which analysis and design of electrical and electronic circuits and systems are based, including lumped circuit, and operational amplifier abstractions.
2. The capability to use abstractions to analyze and design simple electronic circuits.
3. An understanding of how complex devices such as semiconductor diodes ,bipolar and field-effect transistors are modeled and how the models are used in the design and analysis of useful circuits.

Contents And Arrangements Introduction

1. The basic learning of integrated analog unit circuit
2. The frequency characteristics of amplifier circuit
3. The work principle of feedback amplifier and the basis of its stabilization
4. Operational amplifier and its application
5. The basic learning of MOS analog integrated circuit
6. The basic learning of Current-mode circuit
7. Regulators power and high-precision and high-efficiency technologies
8. The use of EDA teaching software the analysis and design methods of electronic circuit

Syllabus of *Electronic technology training*

COURSE CODE: G32A2040

COURSE TITLE: Electronic technology training

Professor： Zhang Wuqian、Cui Jian

Credit/Hours： 2/80

The Purpose and Tasks of the Course

The course is a public compulsory course for engineering majors of undergraduate students. Through the course, students have a more comprehensive understanding of technologies on electronic circuit assembly, design and debugging process.

Students would learn skills on characteristics of electronic components, how to identify and detect components. They would get useful skills on circuit soldering and necessary knowledge on instruments operating. At the end of the course, students should gain the abilities on circuit analysis, instruments operation and circuit board (PCB) designing.

Course Contents

1. Practicing soldering through-hole and surface mounting components.
2. The theory, characters, parameter and testing methods of commonly used electronic components.
3. Theory of transistor amplifier and switching circuit, principle of DC regulated power supply, radio circuit principle.
4. Debugging assembled circuit to required quotas based on the requirements of practice manual or the teacher. Measuring and recording the voltage, current and waveform of key points.
5. Recording and finishing the experiment report.
6. Time allocation
7. Electronic component testing, soldering technology, assembly technology, electronic circuit debugging technology, theory of practice circuit, instruments operation.

Syllabus of *Stochastic Process*

COURSE CODE: 02J70060

COURSE CHINESE TITLE：随机过程理论

COURSE TITLE: Stochastic Process

Credits/Hours:2 /32

Team Leader: LI Chunsheng

Course Descriptions and Objectives

Stochastic Process, along with Probability Theory and Statistics, is a mathematical branch to study stochastic phenomenon. After more than half a century's development, it has become a very active subject area, and has been widely used in communication, radar, navigation, control, biology, social science and other engineering sciences. Stochastic Process is object to the undergraduates who major in electronics. They will learn modern science and technology, and explore a new scientific area after being familiar with and mastering the basic theories and analysis methods of Stochastic Process.

This course mainly contains basic concept of stochastic process, analysis methods of statistical property, time-frequency analysis with the help of linear system, and several types of important stochastic processes such as Gauss process, Narrow-band process, Poisson process and Markov process. As a specialized basic course, it provides basic theoretical knowledge about stochastic process for undergraduates to learn modern signal and information processing theory, modern communication theory, control theory, etc. This course will help students gradually develop and command the ability to analyze and resolve stochastic problems, and it will inspire students to explore and have innovative spirit.

Course Contents

1. Overview, Brief Introduction and Features
2. Overview of Stochastic Process
3. Stochastic Process in the Linear System
4. Gauss Stochastic Process
5. Narrow-band Stochastic Process(2 ClassHours)
6. Poisson Stochastic Process
7. Markov Process

Syllabus of *Microwave Technology*

COURSE CODE：XXXXX
COURSE CHINESE TITLE：微波技术
COURSE TITLE：Microwave Technology
Credits/Hours：4/64

Nature, Purpose and Mission of the Course

Microwave Technology is based on the classical electromagnetic theory. It clarifies characteristics of the transmission system when the sizes of conductors are comparable with the wavelength. The unique concept (electromagnetic field, electromagnetic wave and electromagnetic energy), methods of analysis and measurementare established in this area.

Microwave engineering is an important professional basic course in electronic engineering. It brings together knowledge from several other subjects that are studied in undergraduate programs. The relationships between currents and voltages from electrical circuit theory are combined with the electromagnetic fields studied in electromagnetics and optics, through the dependencies between flowing charges and propagating fields. In this course, the theory of transmission line, waveguide and microwave network should be mastered and used to understand the mechanism of microwave components, which, in turn, promotes and deepens the understanding of the basic theory. Methods of analysis and measurement in microwave engineering should be understood and mastered, so as to provide the basis for the follow-up study and new technology research.

Through the training session of study, experiment, computer operation and homework of this course, students will have a clear concept of the microwave field and master the basic methods of analysis and measurement. Their abilities to analyze and solve problems will be cultivated. Moreover, students' abilities to solve practical engineering problems and achieve their own ideas with the aid of computer are trained.The graduation requirements are listed below:

Course content, the basic requirements and hours distribution

1. Introduction to microwave technology and review of electromagnetic field
2. Transmission line theory
3. Mid-term examination
4. Microwave network analysis
5. Impedance matching and tuning
6. Microwave resonators
7. Use of measurement line and parameter measurement
8. Impedance matching technique
9. Measurement of two-port microwave network

Syllabus of *Analog Electronic circuit Ⅱ*

COURSE CODE: (filled by administrative staffs)
COURSE CHINESE TITLE：电子电路Ⅱ
COURSE TITLE：Analog Electronic Circuits II
Credits/ Hours: 3.5/64

Course Description and Objectives

Analog Electronic Circuits II is the basic specialized course for students who major in Electronics and Telecommunication. It is a course that closely link basic courses with specialized courses. After this course study, students are able to get a better understanding of communication system, modules function, technical indicators, non-linear spectrum transform methods, nonlinear characteristic curve analysis, and nonlinear circuit working principles and engineering approximate calculation method. Students would be familiar with high frequency circuit debugging and design, EDA radiofrequency circuit analysis and design with the aid of computers after EDA experimental lessons. The problem-solving abilities and innovative spirits would be trained and highly recommended.

Course Contents

1. Introduction
2. Two Filter
3. High-Frequency Amplifier
4. Nonlinear Circuit and Analysis Method
5. Sine Wave Oscillator
6. Modulation and Demodulation
7. Locked Circuit
8. Frequency Synthesis Technique
9. Hardware Experiment
10. Capacitance Feedback and Sine-wave Oscillator
11. Amplitude Modulator
12. Amplitude-modulated Signal Debugging
13. Frequency Discrimination of Phase Discriminator Research
14. Frequency Modulation, Voltage-controlled Oscillation and Phase-locked Loop
15. EDA Experiment

Syllabus of *Principle of Automatic Control*

COURSE CODE：02J82160
COURSE CHINESE TITLE：自动控制原理
COURSE TITLE：Principle of Automatic Control
Credits/Hours：2.0/（28＋10）

Course Introduction

This course is a professional elementary course set for undergraduates of School of Electronics and Information Engineering, with the object to make students acquire basic

theories of linear control system, basic analysis and design method of automatic control system, especially the analysis and research method on control system of electronic system and information system, so as to lay foundation for students to research, analyze and design related systems.

This course includes seven chapters, namely, introduction, Control System Modeling, Time-domain Analysis, Root-locus Method, Frequency-domain Analysis, Sampling Control System, and Analysis and Design of State Space. Chapter 1 introduces general concepts of control system, basic requirements on control system, and gives Examples of control system; chapter 2 introduces mathematical modeling and typical links of automatic system; chapter 3 introduces transient response and transient performance index, analysis of stability, and analysis of Stable State Error; chapter 4 introduces Root locus and root locus equation, basic rules of drawing root map, and root locus analysis of control system; chapter 5 introduces Frequency characteristics of basic links, frequency characteristics of open-loop system, Nyquist stability criterion, stability margin, frequency characteristics of close-loop system, and calibration method of control system; chapter 6 introduces sampling and recovery of signal, pulse transfer function, analysis of stability, analysis of Stable State Error, and transient analysis; chapter 7 introduces calculation of state equation, controllability and observability of system, linear transformation and standard form, and pole-allocation and state observer.

The total score includes regular assignment, experiments and final exam.

Course Content

1. Introduction
2. Control System Modeling
3. Time-domain Analysis
4. Root-locus Method
5. Frequency-domain Analysis
6. Sampling Control System
7. Analysis and Design of State Space
8. Teaching Arrangements

Syllabus of *Digital Signal Processing*

COURSE CODE：02j8210
COURSE CHINESE TITLE)：数字信号处理
COURSE TITLE：Digital Signal Processing
Credits/Hours：3.5/54+12/

Course Objectives

The course is a professional basic course, the aim of which is to study the theory of digital signal

processing, the corresponding algorithm and the realization of the software and hardware of these algorithms. The students are expected to lay a solid foundation for further study of professional courses through this course.

Course Contents

1. Introduction
2. Sampling and Reconstruction
3. Discrete Fourier Transform and Fast Fourier Transform
4. Digital Filter
5. Finite Word Length Effect
6. DSP System
7. Digital Filter and DSP implementation of FFT

Syllabus of *Fundamentals of Information Theory*

COURSE CODE：02j8210
COURSE CHINESE TITLE：信息论基础
COURSE TITLE：Fundamentals of Information Theory
Team Leader：LI Chunsheng
Credits/Hours：2/32

Course Description and Objectives

Information Theory is an engineering science to research on general rules in generalized information transmission, extraction and processing system by using probability theory, stochastic process, mathematical statistics and modern algebra. This course is an basic theoretical course for the information engineering major, to let the students know what is information and what is probabilistic information, and how to acquire the basic information theories like Shannon's theorem and coding theorem by using source coding and channel coding to realize efficient and reliable information transmission in communication system and know some typical applications of classical encoding methods and fundamental information theories.

Course Contents

1. Introduction
2. Statistical Measure of Information
3. Discrete Source
4. Discrete channel and channel capacity
5. Source Coding without Distortion
6. Noisy Channel Code
7. Limited distortion source encoding

Syllabus of *Principles of Communication*

COURSE CODE: 02Z82040
COURSE CHINESE TITLE：通信原理
COURSE TITLE：Principles of Communication
Credits/Hours: 3.5/64(48+16)

Course Descriptions and Objectives

Students are required to meet to following requirements:

1. To acquire basic concepts of information transmission, fundamental knowledge on the constitution, classification, property index of communication system as well as information theory.
2. To acquireoperation principles, signal indication, signal transmission bandwidth, modulation and demodulation methods, system anti-noise property analysis(SNR and bit error rate calculation) of various simulation modulation and digital modulation systems； Learn new development of modulation technology.
3. To have a clear mind of threshold effect, aggravation technology, nyquist criterion,eye pattern, equalization principle, partial response principle；to understand optimum receiver principle，matched filtering and derivation and application of the relevant testing.
4. To clearly know the basic concepts and classification of Signal segmentation principle，multiplex and multiple access, and the theory and achievement of FDM(A)、TDM(A)、CDMA eta.
5. To acquire the approaches and property of carrier synchronization、bit synchronization、frame synchronization.
6. To master the property of error control codes principle，linear codes, cyclic codes and convolutional code, and coding and encoding methods.

Course Contents, Basic Requirements and Schedules

1. Introduction
2. AnalogLinear Modulation
3. AnalogAngle Modulation
4. Pulse Code Modulation（PCM）and Delta Modulation（DM）
5. Digital Baseband Transmission
6. Digital Passband Transmission
7. Multiplexing and Multiple Accesses
8. Synchronization
9. Error Control Codes

Syllabus of *Antenna and Feed System*

COURSE CODE：02z8217
COURSE CHINESE TITLE：通信天线与馈电系统
COURSE TITLE：Antenna and Feed System
Credits / Hours： 2/12+12+12

Properties, Objectives

Antenna and Feed System is an important optional course for students majoring in electronic engineering. It is the basis of antenna design, analysis, simulation and test. Based on the demands of engineering practice, this course analyzes the performance and application of fundamental types of antenna and introduces some basic theory and classic analytical methods related to antenna. Meanwhile, it will give a brief introduction to the numerical calculation method of common electromagnetic field. By means of computer operation, the students are expected to master the use of one or two commercial numerical calculation software and be able to design and simulate antennas and microwave devices, laying a preliminary foundation for analyzing the property and parameters of various complex antennas. Through the experiments, the students are supposed to understand the test methods of antenna and feeding and consolidate and expand the contents taught in the classroom. Through the study of this course, the students can lay a solid foundation for future work in the field of wireless communication or further study in this field. Students should grasp the basic theory, analysis and design methods of antenna system, so that they can do well in the study of other related courses.

Course Contents and Basic Requirements

1. Introduction
2. Dipole Antenna and Its Application
3. Aperture Antenna
4. Microstrip Antenna
5. Array Antenna and Smart Antenna
6. Antenna Simulation and Measurement
7. Computational Electromagnetism in Antenna Engineering
8. Brief Introduction to Electromagnetic Field Simulation Software
9. Antenna Measurement

Syllabus of *Principle of Radio Navigation*

COURSE CODE：02z8214
COURSE CHINESE TITLE：无线电导航原理
COURSE TITLE：Principle of Radio Navigation
Credits/Hours：2/36

Course Objectives

By means of this course, the students are supposed to understand the working principle of various typical radio navigation equipment and system, grasp the analytical method, the technical features and operating characteristics of some widely used equipment and system, and know the development direction of the current radio navigation technology.

The students are also expected to master the rapidly developing satellite navigation technology, including the principle and application of GPS system, GLONASS system, double star navigation system, and Galileo navigation system, laying a solid foundation for carrying out further research and application on satellite navigation.

Course Contents and Basic Requirements

This course introduces the basic concepts, principles, applications and development history of radio navigation. Focusing on basic navigation parameters, it mainly talks about the working principle, structural composition, key technology, applications, and equipment accuracy of radio navigation equipment and system which plays a representative role in the amplitude, frequency, time, phase, recombination, satellite and other various types. It focuses on error analysis and applications of GPS system, GLONASS system, double star navigation system and Galileo navigation system.

1. Introduction (basic concepts)
2. Theoretical Basis of Radio Navigation
3. Radio Amplitude Navigation System
4. Radio Frequency Navigation System
5. Wireless Pulse/Time Navigation System
6. Radio Phase Navigation System
7. Composite Radio Navigation System
8. Satellite Navigation System

Bachelor Program of Flight Vehicle Design and Engineering

（in English）

“飞行器设计与工程专业”本科培养方案（英文授课）

(This document is the text compression version of the same major taught in Chinese and only for international students)

School of Aeronautic Science and Engineering & International School

Beihang University, Beijing, China

北京航空航天大学航空科学与工程学院 & 国际学院

September, 2015

Bachelor Program of Flight Vehicle Design and Engineering

飞行器设计与工程专业本科培养方案（全英文授课）

一、 培养目标

I. Educational Objectives

针对留学生的教育背景、认知特点及发展需求，培养具有扎实的自然科学基础知识和必备的专业知识，具有良好的学习能力、实践能力、专业能力、创新能力，团队合作精神与国际视野。培养飞行器总体设计、结构设计、外形设计、性能计算与分析、结构受力与分析、适航审定、故障诊断及维修、飞行器环境控制与生命保障等方面的专业人才。

Based on the education background and development need of oversea students, our Electronic Information Sciences are committed to developing advanced talents that: meet the needs of social development; have high moral integrity and social responsibility; are sound both in body and mind; have a solid grasp of natural science basics and essential expertise; possess good ability in learning, practice, specialty and innovation, as well as team spirit and international outlook. Training professionals in aircraft conceptual design, structural design, configuration design, performance calculation and analysis, structure stress and analysis, airworthiness certification, fault diagnosis and maintenance, aircraft environmental control and life support, etc.

二、 毕业要求

II. Degree Requirements

来华留学生应具有一定的基础汉语水平，了解中国法律法规、传统文化和风俗习惯等，热爱母校，亲华、知华、优华。

Foreign students should have some basic level of Chinese language, understanding Chinese laws and regulations, traditional culture and customs, etc., love alma mater, love China and know China.

在专业方面，毕业生具备良好数学、力学基础，具有飞行器设计工程基本理论和工程应用等方面的基础知识，具备从事飞行器设计科学研究与工程设计的基本能力，具有创新意识、科学素养、社会责任感与工程职业道德。

The students should have a solid math and mechanics foundation, the graduates will hopefully be equipped with the basic theory of flight vehicle design and engineering, the preliminary knowledge of engineering applications, etc., the basic capability to engage in aircraft scientific research and engineering design, which are reinforced by the sense of innovation, science literacy, social responsibility and engineering ethics.

三、 学制、学位

III. Study Period

学制：四年

Study Period：4 Years， Maximum: 6 Years (not including military service time)

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

四、 专业特色

IV. Characteristics

北京航空航天大学飞行器设计与工程专业是建国初期由多所著名大学航空工程系飞行器设计专业合并建立和发展起来的，该专业是我国首批具有硕士、博士学位授权的专业，也是首批博士后流动站单位，1992 年被评为全国同类学科第一名，现为国家重点学科。本学科每年承担和参与多项国家飞行器预研与研制、“973”工程、“863”高技术和国家自然科学基金等重大项目的研究。曾先后主持或参与研制了国内第一架轻型旅客机、“北京一号”，国内第一架高空高速无人侦察机和第一架共轴式遥控直升机，取得了上百项国家和省部级科研成果。目前本专业有以下特色：1. 国内地位高，北京航空航天大学飞行器设计学科创立五十年来，在学术研究和工程实践中形成了优良传统，积累了丰富经验，在我国航空、航天领域享有很高声誉，所隶属的一级学科“航空宇航科学与技术”在全国排名第一；2. 覆盖面广，研究对象含固定翼飞机、直升机、微小型飞行器、战术导弹/火箭弹、空天飞机等，形成了相对稳定、学科框架完善、综合性强、国防特色突出的研究方向；特别是直升机领域，经过“十年磨一剑”，已取得很大发展；3. 型号特色突出，承担包括国家重点型号项目“共轴双旋翼直升机”在内的多项国家型号项目，取得显著成果；4. 在轻型飞机和共轴无人直升机设计技术、隐身设计技术、气动弹性设计技术、先进飞行器结构设计、飞行力学等方面居国内领先水平。

Established in the early days of new China by merging the Flight Vehicle Design majors from many famous universities’ Aerospace Engineering schools, BUAA’s Flight Vehicle Design and Engineering is one of the first majors in China to offer PhD and Master’s degree programs, as well as one of the first post-doctoral research stations. In 1992, it was named the first among the nation’s similar disciplines, and now it is a national key discipline. Every year, the discipline undertakes or participates in the research tasks from many funding and projects, including the pre-research and development of national aircraft, national “973” Project, “863” High-tech Plan, and National Natural Science Foundations. It has developed China’s first light civil airplane named “Beijing-1”, China’s first high-altitude and high-speed unmanned reconnaissance aircraft and China’s first co-axial helicopter. The major bears the following features: 1. High domestic status. Since 1950s, BUAA’s flight vehicle design has formed an eminent tradition and accumulated rich experience in academic research and engineering practice, enjoying a good reputation in China aviation and aerospace fields. The first-level discipline of Aeronautic and Astronautic Science and Technology to which it is affiliated ranks first in the country. 2. Comprehensive research. The research covers the fixed-wing aircraft, helicopters, micro air vehicles (MAVs), tactical missiles/rocket projectiles,

aerospace planes, etc. It has formed a comprehensive and stable disciplinary framework which is of prominent national defence features. In particular, its helicopter research has made remarkable progress during the past decade. 3. Prominent model features. It has assumed a number of national model projects, including the national key model project “coaxial twin-rotor helicopter”, with remarkable results achieved. 4. It leads the nation’s light aircraft and coaxial unmanned helicopter design technology, stealth design technology, aeroelastic design technology, advanced aircraft structure design, flight mechanics, etc.

飞行器设计与工程专业包括飞机设计、直升机设计、适航技术与管理和飞行力学等方向可供学生选择，毕业生主要从事飞机、火箭、导弹、卫星等飞行器的设计、实验、研究、运行维护等工作，还可从事民用机械、交通运输工程、船舶与海洋工程、工业与民用建筑工程、软件工程等方面的设计与科研、教学工作。

Flight Vehicle Design and Engineering major offers the following orientations for students to choose: aircraft design, helicopter design, technology and management of airworthiness and flight mechanics. The graduates mainly engage in the design, experiment, research, operation and maintenance of aeroplanes, rockets, missiles, satellites, etc. They can also embark on the design, research and teaching of civilian machinery, transportation engineering, ship and marine engineering, industrial and civil construction engineering, software engineering, etc.

五、 课程体系

V. Program Structure and Modules

共分为四个课程模块：基础课程、语言及文化课程、通识课程和专业课程。

There are three course modules: Foundation Courses, General Education (GE) Courses, Major Courses.

表 1 课程体系及各课程类别的最低学分要求示意图

Table 1 The Credit Requirement (Minimum) of each Course Type for Bachelor in Flight Vehicle Design and Engineering

课程模块 Course Module	Order	课程类别 Course Type	学分 Credits
I 基础课程 Foundation Courses (FC)	A	数学与自然科学类 Mathematics and Natural Sciences (MNA)	31.0
	B	工程基础类 Engineering Fundamentals (EF)	12.5
	C	语言和文化 Language and Culture (LC)	10.0
II 通识课程 General Education	D	思政类 Ideology and Politics (IP)	——
		军理类	——

Courses (GE)		Military Theory (MT)	
	E	体育类 Physical Education (PE)	--
	F	核心通识课程 Core GE Courses (C-GE)	2.0
	G	一般通识课程 General GE Courses (G-GE)	2.0
	H	博雅类 Liberal Arts (LA)	--
III 专业课程 Major Courses (MC)	I	核心专业基础课 Core Major Course (C-MC)	88.0
	J	一般专业课 General Major Course (G- MC)	
	L	专业实践课 Practical Major Course (PMC)	

基础课程模块，主要包括数学与自然科学类（如数学、物理等）、工程基础类（如机械和 C 语言程序设计等），以及语言类。其中，《汉语》和《中国概况》是来华留学英文授课本科生的必修课。通识课程模块，旨在培养和提高学生在人文、社科等方面的知识和修养。专业课程模块，分为专业核心类和专业选修类。学生可根据个人的兴趣及发展方向，在学业指导老师的指导下学习。

Foundation courses include Mathematics and Natural Sciences courses (Mathematics, Physics, etc.), Engineering Fundamentals courses (Mechanism, C language, etc.). Language courses include Chinese courses for oversea student studied in China. General Education courses are courses to improve knowledge and cultivation in humanities and social sciences. Major courses are divided into Specialized Core Courses and Specialized Elective Courses. The students can select based on their own interest and direction under the guidance of supervisor.

六、 主要课程

VI. Main Major courses

理论力学 A（1）、理论力学 A（2）、材料力学 A、空气动力学 A、画法几何、机械制图、机械设计基础 A(1)、热工基础 A（1）、自动控制原理 B、飞行力学、飞机总体设计、飞机结构设计、飞行器结构力学、毕业设计。

Theoretical Mechanics A(1)、Theoretical Mechanics A(2)、Mechanics of Materials A、Aerodynamics A、Descriptive Geometry、Mechanical Drawing、Basics of Machine Design A(1)、Fundamentals of Thermal Engineering (1)、Automatic Control Theory B、Flight Mechanics、Aircraft Conceptual Design、Aircraft Structural Design、Structural Mechanics of Aircraft、Graduation Project.

七、 主要实践教学环节及安排

VII. Main Internship and Practical (Including experiments)

表 2 实践课程清单

Table2 Practical Course

序号 No.	课程名称 Course Title	课程类别 Course Type	开课学期 Semester	学分 Credits	总学时 Hours
1	机械工程技术训练 A Mechanical Technology Practice A	B 工程基础	2	3.5	144
2	基础物理实验 B (1) Fundamental Physics Experiments B (1)	A 数/物	3	1.5	28
3	基础物理实验 B (2) Fundamental Physics Experiments B (2)	A 数/物	4	1.5	24
4	毕业设计 Graduation Project	I 专业核心类	7-8	8.0	16weeks

八、 毕业最低学分

VIII. Minimum Required for Graduation

毕业最低学分要求：在满足各课程类别最低学分的要求下，总学分不低于 125 学分。

Minimum Required for Graduation=125 credits, and meet the credit requirement of each Course Type at the same time.

九、 教学进程计划

IX. Education Curriculum

the 1st Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A09101BL	工科高等数学 (1) Advanced Mathematics for Engineering (1)	90	6.0	Compulsory	MNA	Examination
B25D111I	中国概况 Introduction to China	32	2.0	Compulsory	LC	Examination
B1C251131L	汉语 (1) Chinese (1)	64	4.0	Compulsory	LC	Examination
B2F050121L	航空航天概论 B Introduction to Aeronautics and Astronautics B	32	2.0	Compulsory	C-GE	Examination
B1B061011L	大学计算机基础 University Computer Foundation	44	2.0	Compulsory	G-GE	Examination
B1B321011L	工程认识 Engineering Experience and Cognition	20	0.5	Compulsory	EF	Examination
E05B1030	工程图学 B Engineering Graphics B	64	4.0	Compulsory	C-MC	Examination

	学期学分小计 Semester Credits		20.5			

the 2nd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A09102BL	工科高等数学 (2) Advanced Mathematics (2)	86	5.0	Compulsory	MNA	Examination
B1A191011L	工科大学物理 (1) University Physics for Engineering (1)	64	4.0	Compulsory	MNA	Examination
B1C251141L	汉语 (2) Chinese (2)	64	4.0	Compulsory	LC	Examination
B1A091031L	工科高等代数 Advanced Algebra	80	5.0	Compulsory	MNA	Examination
B1B322010	机械工程技术训练 A Mechanical Technology Practice A	140	3.0	Compulsory	EF	Examination
C25D121I	C 语言程序设计与实践 C Programming Language	48	2.5	Compulsory	EF	Examination
	学期学分小计 Semester Credits		23.5			

the 3rd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A062041L	概率统计 A Probability Statistics A	48	3.0	Compulsory	MNA	Examination
B1A05201BL	复变函数 Complex Variables	32	2.0	Compulsory	MNA	Examination
B1A192011L	工科大学物理(2) University Physics for Engineering (2)	64	4.0	Compulsory	MNA	Examination
B1A192031L	基础物理实验 B (1) Fundamental Physics Experiments B (1)	28	1.5	Compulsory	MNA	Examination
B3I052011L	理论力学 A(1) Theoretical Mechanics A(1)	64	4.0	Compulsory	C-MC	Examination
B3I032011L	电路分析 Circuit Analysis	48+16	3.5	Compulsory	G-MC	Examination
B1C251151L	汉语(3) Chinese (3)	64	4.0	Compulsory	LC	Examination
	学期学分小计 Semester Credits		22.0			

the 4th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A192041L	基础物理实验 B (2) Fundamental Physics Experiments B (2)	24	1.5	Compulsory	MNA	Examination
B3I052021L	理论力学 A(2) Theoretical Mechanics A(2)	24	1.5	Compulsory	C-MC	Examination
B3I052031L	材料力学 A Mechanics of Materials A(2)	64+16	5.0	Compulsory	C-MC	Examination
B3I052111L	空气动力学 A Aerodynamics A	64+16	5.0	Compulsory	C-MC	Examination
B3I072031L	机械原理 Theory to Machines and Mechanisms	54	2.5	Compulsory	G-MC	Examination

B3I052121L	热工基础(1) Fundamentals of Thermal Engineering (1)	64	4.0	Compulsory	C-MC	Examination
B3I321021L	工程材料学 The Science of Engineering Materials	32	2.0	Compulsory	G-MC	Examination
B1B322041L	电子工程技术训练 Electronic Technology Practice	80	2.0	Compulsory	EF	Examination
B1C251161L	汉语(4) Chinese (4)	64	4.0	Compulsory	LC	Examination
	学期学分小计 Semester Credits		27.5			

the 5th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3I053151L	自动控制原理 B Automatic Control Theory (B)	42+6	3.0	Compulsory	C-MC	Examination
B3I053111L	飞机总体设计 Aircraft General Design	40+8	3.0	Compulsory	C-MC	Examination
B3I053121L	飞机结构设计 Design Aircraft Structure Design	48+8	3.5	Compulsory	C-MC	Examination
B3I073041L	机械设计 Mechanical Design	64	3.0	Compulsory	??	Examination
B3I050511	弹性力学 Mechanics of Elasticity	48	3.0	Compulsory	G- MC	Examination
B3J05070A	振动力学基础 Vibration Mechanics Foundation	32	2.0	Compulsory	G- MC	Examination
	学期学分小计 Semester Credits		17.5			

the 6th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3I053161L	飞行力学 Flight Dynamics	36+4	2.5	Compulsory	C-MC	Examination
B3I053131L	飞行器结构力学 Structural Mechanics of Aircraft	48	3.0	Compulsory	C-MC	Examination
B3J05030AL	直升机飞行性能、操纵及稳定性 Helicopter Flight Performance, Control and Stability	16	1.0	Compulsory	G- MC	Examination
B3J05032AL	直升机总体设计 Helicopter General Design	24	1.5	Compulsory	G- MC	Examination
B3J05041AL	计算流体力学 Computational Fluid Dynamics	32	2.0	Compulsory	G- MC	Examination
B3J05044AL	实验流体力学 Experimental Fluid Mechanics	32	2.0	Compulsory	G- MC	Examination
B3J050531	断裂与损伤力学 Fracture and Damage Mechanics	32	2.0	Compulsory	G- MC	Examination
B3J050581	复合材料力学 Compound Material Mechanics	32	2.0	Compulsory	G- MC	Examination
B3J050611	结构分析中的有限元法 Structure Analysis of Finite Element Method	32	2.0	Compulsory	G- MC	Examination
B3J050691	有限元方法在结构分析中的应用 The Finite Element Method in the Application of the Structural Analysis	32	2.0	Compulsory	G- MC	Examination

	学期学分小计 Semester Credits		20.0			

the 7th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3J05025AL	气动弹性设计 Aero-elastic Design	16	1.0	Compulsory	G- MC	Examination
B3J05040AL	高超音速空气动力学基础 Fundamentals of Hypersonic Aerodynamics	32	2.0	Compulsory	G- MC	Examination
B3J050561	分子动力学理论与实践入门 Introduction to Molecular Dynamics Theory and Practice	32	2.0	Compulsory	G- MC	Examination
	学期学分小计 Semester Credits		5.0			

the 8th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3I054011L	毕业设计 Graduation Project	16weeks	8.0	Compulsory	PMC	Test

备注

(1) 只列出各学期必修课程目录

Only compulsory courses are listed;

(2) **课程类别的相关说明**

Explanation of course type:

数学与自然科学类 Mathematics and Natural Sciences (MNA)
工程基础类 Engineering Fundamentals (EF)
语言和文化 Language and Culture (LC)
核心通识课程 Core GE Courses (C-GE)
一般通识 General GE Courses (G-GE)
核心专业基础课 Core Major Courses(C-MC)
一般专业课 General Major Course(G-MC)
专业实践课 Practical Major Course (PMC)

如下课程留学生可选修

Other courses student can select

Course Type	Title	Credits	Note
PE	体育课(1) Physical Education	0.5 Credit/Semester	International students can select from the 2nd semester.
LA	文化素质拓展 Culture Quality Developing	1.0 Credit/Semester	International students can select from the 3rd semester.
G-GE	暑期学校系列课程 Courses in Summer Camp	Max 6.0 Credits /Summer Semester	International students can select the courses in summer semester (3rd semester) during the 2nd or the 3rd academic year.

G-GE	专业英语阅读与写作 Professional English Reading and Writing	2.0 Credits/Semester	International student can select since 5th semester.
	社会实践 Social Practice	1.0 Credit	
	汉语水平考试 HSK	1.0 credit	One credit will be offered if the international student passed HSK 3 or over.
	其他课程 Other Courses		See the time-table at the beginning of each semester.

十、 联系方式

X. Contact Detail

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37 Xueyuan Rd. Haidian District, Beijing, China
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Web Site: http://www.buaa.edu.cn
http://is.buaa.edu.cn

Syllabus of *Higher Mathematics for Engineers (1)*

COURSE CODE: B1A091061L
COURSE TITLE: Higher Mathematics for Engineers (1)
LECTURER: YA Li
HOURS: 90
CREDITS: 6

Course Description

This course is a first course in the calculus of one variable intended for engineering major. This course mainly concentrates on the functions of one variable, which includes topics of derivatives and integrals of functions and a variety of applications of differentiation and integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Contents and Arrangements

This course covers Chapter 1-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Functions and Models
2. Limits and Derivatives
3. Differential Rules
4. Application of Differentiation

5. Integrals
6. Applications of Integration
7. Techniques of Integration
8. Further Applications of Integration
9. Differential Equations
10. Parametric Equations and Polar Coordinates

Syllabus of *Introduction to China*

COURSE CODE: B1C251221L
COURSE TITLE: Introduction to China
LECTURER: SUN Yan
HOURS: 32
CREDITS: 2

Course Characteristics

This course is tailored for foreign students who learn their undergraduate majors in English-Medium, and it is a compulsory course categorized in general courses. General speaking, owing to limit experience and mislead of medium oversea the most of the undergraduate students have fragmental, superficial, not comprehensive and even sometimes wrong on China and Chinese society. This course will not only impart comprehensive and systematical knowledge into foreign students on Chinese geography, Custom, culture, history, Education, legal system and political system, but also introduce some hot topics to foreign students for example , reform and open to outside world policy and its achievements, religion and its policy, population and its policy, as well as foreign policy and the policies toward Hang Kong, Macao and Taiwan.

Course Target and Task

This course will fulfill the students following graduation tasks: 1. They will obtain an overall, systematical and positive understanding about China. 2. Affection will be cultivated and this course will lay a foundation to foster scholars who know China, treat China as a friend and support China. 3. This course will benefit their further study and life in China and provide them with necessary knowledge and information to understand Chinese society and communicate with Chinese. So it is very important aim for this course to provide some necessary, basic, accurate and important information to foreign students in order to understand China and the Chinese well.

Topics, Lectures and Hours Distribution

This course consists of twelve topics two practices. Twice practices will make students to experience and witness Chinese culture and Chinese society personally. Detail arrangements are as follows:

1. Basic Information and national condition, including the territory administrative division, climate etc.
2. Chinese traditional festivals and customs
3. Chinese History and Confucius
4. Reform and Open to Outside World and Its Achievements
5. Education , Religion and its Policy
6. Political System and State structure
7. Legal System
8. Population and its Policy
9. Foreign Policy and the Policies Toward HK, Macao and Taiwan visiting a Museum
10. Visiting Yuan Ming Park or Great Wall

Syllabus of *Chinese (1)*

COURSE CODE: B1C251151L
COURSE TITLE: Chinese (1)
COURSE CHINESE TITLE: 汉语（1）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course is prepared for overseas students who have never learnt Chinese or those who have a command of less than 100 new words. The course is based on the study of new words and grammar, and at the same time focuses on the cultivation of listening and speaking ability. Students need to complete primary communication tasks (including confirmation, introduction, time and direction, daily needs) which help students to acquire initially comprehension and expression ability and conduct basic conversation in Chinese in daily life and school life.

The course aims to help most students to be up to HSK1 level in listening, speaking, reading and writing aspects.

Course contents

The course contents and detail arrangement are as follows:

1. The study of Pinyin (Chinese phonetic alphabet)
2. Topics about: Name& nationality, Personal belongings, Family, Class, Birthday and Date, Work and rest, School, Room, Have a meal, Shopping, Handle affairs, Means of transportation etc.

Syllabus of *Introduction to Aeronautics and Astronautics (B)*

COURSE CODE: B2F050121L
COURSE TITLE: Introduction to Aeronautics and Astronautics（B）
RESPONSIBILITY PROFESSOR: YANG Chao, JIA Yuhong
SEMESTER: Fall/Spring
CREDITS: 2
HOURS: 26

Course Description

《The Introduction of Aeronautics and Astronautics》is a required course for the students of first year in the university. It is about basic knowledge, basic principles and development situation of aeronautics and astronautics technology. The learning of this course can stimulate the learning interest of students and improve the understanding for basic contents of aeronautics and astronautics technology.

Course Objective

The learning purpose of this course is to learn about the general development situation, basic concepts, basic knowledge of aeronautics and astronautics field, and learn about the position and function of learning specialty in aeronautics and astronautics technology.

1. Knowledge ability
2. Ability to explore problems and solve problems
3. Ability of leadership and guidance
4. Consciousness of morality and service
5. Enhance international view

Course Contents

1. General development situation of aeronautics and astronautics
2. Flight environment and flight principles
3. Energy power system of flight vehicle
4. Airborne equipments of flight vehicle
5. Flight vehicle structure

Syllabus of *University Computer Foundation*

COURSE CODE: B1B061011L
COURSE TITLE: University Computer Foundation (International College)
COURSE CHINESE TITLE: 大学计算机基础
RESPONSIBILITY PROFESSOR: CAO Qinghua

CREDITS: 2
HOURS: 44 (26 Hours in class +18Hours for experiments)

The Nature, Purpose, and Goals of this Subject

This course is a basic course for students majoring in computer science. The arrangement of the course uses the method of combining theory and practice, the key to help students master the basic skills of computer, practical operation and comprehensive application, and then improve the students' ability to analyze problems and solve problems.

The teaching of this course and the computer experiment, students should meet the basic requirements including: the basic concepts of computer, computer basic knowledge and principle, network knowledge and multimedia application technology. The general objectives for this course can be divided into the following:

1. The development of computer, new technology and modern information technology.
2. Master the conversion between carry counting system and number system method, and method of data in the computer.
3. Master computer system components and working principle.
4. Comprehensive application of common office software.
5. Basic knowledge and application of computer network.
6. Understand the concept of information security.
7. Concept and application of multimedia.
8. In accordance with the requirements, Cooperative writing papers and submit.

Course Contents

1. Computer Basic Knowledge
2. Computer System
3. Office Software
4. Computer Network
5. Information Security And Morality
6. Multimedia Technology Foundation
7. Comprehensive

Syllabus of *Engineering Knowing*

COURSE CODE: B1B321011L
COURSE TITLE: Engineering Knowing
COURSE CHINESE TITLE: 工程认识实习
LECTURER: MA Pengju
HOURS: 16
CREDITS: 1

The Text of the Course Outline

To describe the definition and connotation of subject terms of the course title;

Engineering Knowing is the first level of engineering training in the core courses of the school management. Through the summary and introduction of engineering materials, machinery manufacturing, electrical and electronic technology, testing technology, and mechanical and electrical integrated and industrial control and combination of the typical manufacturing processes, the visit of equipment and typical practice of application cases, students are enabled to have a understanding of the general picture on the above-mentioned industrial and technical fields, in order to cultivate them with preliminary engineering consciousness and practice ability.

To describe the status, characteristics and the main content of the course in the personnel training;

1. Students can have a preliminary acquaintance of the general structure of mechanical and electrical products, the used materials, processing technology and improve the manipulative ability through the disassembly practice of common and typical mechanical and electrical products.
2. By visiting the machinery manufacturing technology, students can have a certain understanding on the manufacturing process, used tools and equipment of machinery products. They can deepen the comprehension that science and technology constitute the primary productive force and improve the interest of mastering the knowledge and skills through the comparison of basic manufacturing technology and modern manufacturing technology.

Course Content and Basic Requirements

1. Mechanical Design and Manufacturing
   1) To understand engineering graphics and digital design;
   2) To comprehend the basic knowledge of machines (parts, components, machines, drive, materials, processing technology);
   3) To acquire the mechanical manufacturing process and equipment;
   4) To know the advanced manufacturing technology.
2. Bicycle Disassembly
   1) To acquire the basic components of a bicycle;
   2) To understand the typical mechanical structure;
3. Electrical and Electronic Technology
   1) To comprehend the generation and transmission of electric energy;
   2) To understand the circuit of the user side;
   3) To know motor control;
   4) To acquire the recognition and characteristics of electronic components;
   5) To comprehend the introduction of electronic technology.
4. Testing technology, Mechanical and Electrical Integration and Industrial Control Technology
   1) To know the sensing, non-electric power conversion, signal amplification and conditioning;
   2) To understand the instrument technology;
   3) To comprehend the introduction of electrical and mechanical transmission and control technology (including electrical engineering and fluid).

Syllabus of *Engineering Graphics B*

COURSE CODE: E07B103I
COURSE TITLE: Engineering Graphics B
LECTURER: Wang Yunqiao
HOURS: 54+10
CREDITS: 4.0

COURSE DESCRIPTION

Engineering drawing is the important and necessary tool to communicate technical ideas for engineers and Engineering graphics is the requisite fundamental course for the engineering students. Traditional multiview projection theory and computer graphics are introduced for solving engineering problems graphically. The standards and conventions in 2D drawings and 3D models by computer aided design softwares. Engineering drawing can be read and interpreted accurately. The ability to draw and think in visible forms will be trained.

COURSE OBJECTIVE

Cultivate and develop the students' spatial analysis and spatial visualization abilities by using engineering drawings and models. Students learn to create a standard engineering drawing to represent a geometry solid or engineering features using hand tools or CAD and read and understand drawings. The national and international standards about engineering drawing and modeling , as well as some common used mechanical constructions, thread, gear, key and assembly will be introduced.

CONTENTS AND ARRANGEMENTS

1. Introduction: Descriptive geometry and mechanical drawing
2. Fundamental for mechanical drawing
3. Dimension and Geometric Construction
4. Basic Orthographic Projection
5. Primitive Solids and Cutting
6. Simple Composite Solids
7. Intersection of solids
8. Introduction to Computer Drawing and Modeling
9. Pictorial drawing and third-angle projection
10. Fundamental methods for representation of mechanical parts
11. Dimensioning of complex part
12. Threads
13. Detail Drawing
14. Assembly Drawing

Syllabus of *Higher Mathematics for Engineers (2)*

COURSE NUMBER: B1A091071L
COURSE NAME: Higher Mathematics for Engineers (2)
LECTURER: PENG Gao
HOURS: 86
CREDITS: 5

Course Description

This course is a second course in the calculus of one variable intended for engineering major. It is designed to meet the needs of students who have completed Higher Mathematics for Engineers (1) and desire to extend their skills in this subject. This course mainly concentrates on the integral calculus. Topics include an overview of integration, basic techniques for integration, a variety of applications of integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Course Contents

This course covers Chapter 6-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Applications of Integration
2. Techniques of Integration
3. Further Applications of Integration
4. Differential Equations
5. Parametric Equations and Polar Coordinates

Syllabus of *University Physics for Engineering I, II*

COURSE CODE: B1A19101BL，B1A19201BL
COURSE TITLE: University Physics for Engineering I, II
LECTURER:
HOURS: 64
CREDITS: 4

Course Characteristics

Physics is the subject of studying the basic structure of matters, the interactions between them, and the most fundamental and universal movements of the matters and their transformations. Physics is the basis of all natural sciences. In the 2l century, physics will still be in the leading position in the developments of science and technology.

Through College Physics teaching shall guides the students to acquire a comprehensive and systematic knowledge and understanding about the basic concepts, theories and methods of physics. In addition, through College Physics teaching shall as well enable the students to have preliminary ability of applying the knowledge.

The concrete requirements of these three levels are as follows:

1. Mastery: thoroughly understand the physical contents, master the applicable conditions, and be able to use skillfully. Generally required to be able to derive formulas.
2. Understanding: Generally not required to derive formulas but be able to analyze and calculate the relevant problems.
3. Acquaintance: know about the content. Be able to give qualitative explanation and do simple calculation. Generally not required to apply.

Course Content

1. Mechanics
   1) Particle kinematics
   2) Newton's law
   3) Work and energy
   4) Impulse and momentum
   5) Motion of rigid body
   6) Special theory of relativity

2. Electromagnetism
   1) Electrostatic field
   2) Constant magnetic field
   3) Electromagnetic induction
   4) Electromagnetic field

3. Kinetic theory of gases and Thermodynamics
   1) Kinetic theory of gases
   2) Thermodynamics

4. Mechanical vibration

5. **Wave and Wave Optics**
   1) Mechanical Wave
   2) Electromagnetic Wave
   3) Wave Optics
6. **Modern Physical Basis**

Syllabus of *Chinese (2)*

COURSE CODE: B1C251161L
COURSE TITLE: Chinese (2)
COURSE CHINESE TITLE: 汉语（2）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course aims to help overseas students who have already had a foundation of Chinese to proficiently use Chinese Pinyin and write commonly-used Chinese characters. Students are required to have a command of more than 600 common words and 60 grammar points, at the same time further improve their understanding and communicative abilities. It also helps students to lay a firm foundation to well prepare for Chinese study in second year. It requires students to use Chinese language knowledge and skills to solve basic problems in daily life and complete primary communicative tasks in the course, such as life schedule, asking for help, explanations, descriptions and comparisons. The course emphasizes the training of listening, speaking, reading and writing to improve comprehensive abilities. At the same time, it will teach students with study methods to strengthen their confidence in language learning and guide them to study by themselves.

The course aims to help most students to be up to HSK2 level in listening, speaking, reading and writing aspects.

Course contexts, tasks and study hours

The course contents and detail arrangement are as follows:

1. Daily activities
2. Weekends
3. Chinese Courses
4. Sports
5. Personal Skills
6. Direction & Distance
7. Accommodation
8. Hobbies
9. Health
10. Age, Height and Weight
11. Dress

12. Chinese study
13. Weather
14. Food
15. City
16. Event

Syllabus of *Advanced Algebra in engineering*

COURSE CODE: B1A091031L
COURSE NAME: Advanced Algebra in engineering
LECTURER : ZHAO Di ; LI Hongyi
HOURS: 64 hours lectures +16 hours drills
CREDITS: 5

COURSE DESCRIPTION

Linear Algebra is an undergraduate course. It has been introduced here as a handy tool for solving practical problems. Linear Algebra has many applications in other disciplines, such as statistics, economics, engineering, physics, biology, and business. Linear Algebra is ore useful now than at almost any time in the past. Due to the computer revolution, Linear Algebra has risen to a role of prominence in the mathematical curriculum.

COURSE OBJECTIVE

Students are asked to solve similar problems or explain the basic concepts. The study of Linear Algebra instills habits of thought that are essential for a proper understanding of many areas of pure and applied mathematics.

COURSE CONTENTS

1. Determinants
2. Matrices
3. Linear dependence of vectors
4. Linear equations
5. Similar standard form
6. Inner space and Quadratic form

Syllabus of *Mechanical Technology Practice A*

COURSE CODE: B1B322011L
COURSE TITLE: Mechanical Technology Practice A
LECTURER: MA Pengju
HOURS: 140 hours
CREDITS: 3.5

The Nature, Purpose and Task of the Course

Mechanical Technology Practice is an important basic technical course, which takes mechanical manufacturing as the carrier in the undergraduate college in order to cultivate students' ability of engineering practice.

1. To understand the whole technical process of production mode and machines in modern manufacturing industry from the materials, parts, to even the machines, get familiar with the main forming methods of engineering materials and the main machining methods, possess with a preliminary skill of independent operation, and lay a good foundation for the follow-up courses, graduation design, professional course design, comprehensive experiments, and extra-curricular scientific and technological practice.
2. To master the process knowledge and the knowledge of modern management in a certain extent, cultivate students' ability of engineering practice and team spirit, and improve and strengthen students' innovation consciousness and innovation ability.
3. To make the students understand and comprehend the common technology in mechanical manufacturing system through training (such as transmission technology, detection and display technology, and information synthesis and control technology, etc.), and provide a sensible understanding to the follow-up courses.
4. To carry out the ideological education, train and exercise the attitude to labor, and quality and economic concepts, strengthen students to observe labor discipline and comply with the safety rules in consciousness, and improve the overall quality of students.

Course Content, Basic Requirements and Allocation of Credit Hours

1. Practice of Heat Treatment for Surface Protection
2. Casting Practice
3. Forging and Pressing Practice
4. Welding Practice
5. Practice as the Lathe Worker
6. Active as a Miller
7. Practice as the Grinder
8. Practice as the Bench Worker
9. Practice of Wire Cut Electrical Discharge Machining
10. Laser Practice
11. Practice of Numerical Control Machining

Syllabus of *C Language Programming*

COURSE CODE: B1B021121L
COURSE NAME: C Language Programming
COURSE CHINESE NAME: C 语言程序设计
LECTURER: WANG Li-jing
HOURS: 48
CREDITS: 2.5

The Nature, Purpose and Task of the Course

1) C language is a computer language used widely at home and abroad, which has been widely applied in the development of system software and application software with its rich and flexible control and data structure, simple and efficient expressions, clear program structure, and good portability.
2) Purpose and mission is to guide students into a great potential curriculum design of computer programming, cultivate students' logical thinking ability, abstract ability and basic computer programming skills.
3) Through the study of this course, students master a high-level programming language, learn to use the C language to solve general application problems. Learn to read simple application written in a computer programming language, master the basic structured programming method and basic steps of using computers to solve practical problems, and lay a good foundation for further study of the other basic courses and professional courses. The C programming language is a very strong practical courses,which must be required through hands-on learning of knowledge, so special emphasis on combing lecture and hands-on is necessary, while make sure every student have adequate computer conditions.
4) Key skillsaccording with graduate training target in mining issues and problem-solving: training students to think independently, active discovery, analysis, design and problem solving, and have the basic research skills for engaging in aircraft design disciplines.

Course Content

1. Programming and C language
2. Algorithm-the soul of the program
3. The simplest programming -sequential programming
4. Selective structure programming
5. Cycle structure programming
6. Batch process data by using array
7. Block-based design by using function
8. Excelingat using pointer
9. Building the data type of the user
10. Input and output to the file

Syllabus of *Probability and Statistics A*

COURSE CODE: A09B204I
COURSE NAME: Probability and Statistics A
LECTURER: Mahboob Iqbal
HOURS: 48
CREDITS: 3

Course Description

This course provides an introduction to probability and statistics with engineering applications. Topics include: fundamentals of statistics; basic probability models; combinatorics; random variables; discrete and continuous probability distributions; statistical estimation and testing; confidence intervals; regression; and introduction to random processes.

Course Objective

Understand random outcomes and random information

1. Learn how handle statistical information
   1) statistical analysis
   2) model building
2. Understand probability theory
3. Learn random variables and distributions
4. Know-how of random processes

Contents and Arrangements

1. Introduction to Statistics
2. Descriptive Statistics
3. Elements of Probability
4. Random Variables
5. Special Probability Distributions
6. Distributions of Sampling Statistics
7. Statistical Estimation
8. Hypothesis Testing
9. Correlation and Regression
10. Random Processes

Syllabus of *Complex Analysis*

COURSE CODE：B1A05201B
COURSE TITLE: Complex Analysis
COURSE CHINESE TITLE：复变函数
LECTURER: CHEN Yulin
Credits: 2
Hours： 32

Course Type and Main Objectives

This course is a fundamental course in college of Engineering. It helps sophomores and juniors to further study mathematics after learning Mathematical Analysis. Studying this course, the students in engineering majors, such as aeronautics, mechanical engineering and civil engineering, can master and apply mathematical tools to prepare for the specialized courses. In this course, students are required to master the basic content of the textbooks, to complete exercises of each chapter and homework assignments independently, and to analyze specialized models by using the integrated knowledge of complex function.

This course supports the following graduation requirements:

A. Basic theory and knowledge of mathematics.

F. Basic methods of literature search and certain scientific research and practical work abilities.

Course Content

1. Introduction
2. Analytic functions
3. Complex functions integrals
4. Series
5. Residues exordium

Syllabus of *General Physics Experiment*

COURSE CODE：A19A203，A19A204
COURSE TITLE：General Physics Experiment
COURSE CHINESE TITLE：基础物理实验 B(1)(2)
LECTURER: LI Hua
Hours: 60
Credit：3.5

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It

is a beginning for students to learn systematic experimental method and technology.

Students could get basic knowledge as follows: measuring method offundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on) and error evaluation of measuring result.

Course Contents

1. Measurement of metal elastic modulus
2. Measuring moment of inertia of a rigid body
3. A series of experiments on the air track
4. Digital measurement experiment
5. Thermal experiment
6. The application of the oscilloscope
7. Resistance measurement
8. Potentiometer and its applications
9. Thin lens and the focal length of a single spherical mirror measurement
10. Spectrometer adjustment and its application
11. Light interference experiment I（Partial wave surface method）
12. Light interference experiment II（Sub-amplitude method）

Syllabus of *Theoretical Mechanics A*

Course Code： B3I05201A
Course Chinese Name: 理论力学 A
Course English Name： Theoretical Mechanics A
Semester: Autumn & Spring Semester
Lecturer： Wang Qi, Guo Yi Yuan
Credit： 5.5/90

Nature, Target and Task of the Course

Theoretical Mechanics is not only the foundation of all mechanical courses, but also a technical basic course that focuses on statics analysis, kinematics analysis and dynamics analysis of engineering objects. It is widely used in many engineering fields. The task of Theoretical Mechanics is: to let the students grasp the basic rules and research methods of mechanical motions (including equilibrium) of a particle, a system of particles, a rigid body,

and a system of rigid bodies, thus to form a necessary background for relevant follow-up courses, for learning and mastering new sciences and technology in the future; to let the students preliminarily grasp how to analyze and solve some simple engineering problems with the basic principles and methods of Theoretical Mechanics ; to cultivate the students' scientific ways of thinking, the right world view, and the related ability according to the characteristics of the course.

Course Contents

1. Introduction
2. Equilibrium of a Particle
3. Equilibrium of a Rigid Body
4. Equilibrium of Rigid Body Systems and Structures
5. Equilibrium of a Particle System
6. Dynamics of a Particle
7. Dynamics of a Particle System
8. Dynamics of a Rigid Body (part one)
9. Method of Dynamic-static
10. Lagrange Equations
11. Dynamics of a Rigid Body (part two)
12. Fundament of Mechanical Vibration

Syllabus of *Circuit Analysis*

Course Code：E03B2010
Course title in Chinese：电路分析
Course title in English：circuit analysis(A)
Team leader：XXX
Hours/ credits：48/3

Objective

This course is an undergraduate in electromechanical important technical basic course. Through this course the students the basics of modern circuit theory and basic calculation method to master, to lay the necessary foundation for further learning relevant follow-up electrical courses. This course is for students to learn scientific thinking ability, establish a theory with practical engineering concepts and improve students analyze problems, problem-solving skills have an important role.

Course Contents

1. Circuit model and circuit Law
2. Resistive circuit equivalent transformation

3. Resistor circuit analysis
4. Circuit Theorem
5. Phasors
6. Sinusoidal steady state circuit analysis
7. Of the circuit includes a coupled inductor
8. Of the three-phase circuit
9. Non-sinusoidal Current Circuit
10. First order and second-order time-domain circuit analysis circuit
11. Laplace transform
12. Of two-port networks

Syllabus of *General Physics Experiment*

COURSE CODE：A19A203，A19A204
COURSE TITLE：General Physics Experiment
COURSE CHINESE TITLE：基础物理实验 B(1)(2)
LECTURER: LI Hua
Hours: 60
Credit：3.5

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It is a beginning for students to learn systematic experimental method and technology.

The course of general physical experiment has various experimental ideas, methods and tools to provide comprehensive training for basic experimental technology. It is an important foundation for students to enhance scientific experimental ability and scientific accomplishment. It could not be replaced by other practical courses for students to train their religious scientific attitude, active consciousness of innovation, comprehensive ability of connecting theory and practice, adaptability of the development of science and technology, and so forth.

Students could get basic knowledge as follows: measuring method of fundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on) and error evaluation of measuring result.

Course Contents

1. Measurement of metal elastic modulus

2. Measuring moment of inertia of a rigid body
3. A series of experiments on the air track
4. Digital measurement experiment
5. Thermal experiment
6. The application of the oscilloscope
7. Resistance measurement
8. Potentiometer and its applications
9. Thin lens and the focal length of a single spherical mirror measurement
10. Spectrometer adjustment and its application
11. Light interference experiment I（Partial wave surface method）
12. Light interference experiment II（Sub-amplitude method）

Syllabus of *Mechanics of Materials (A)*

Course Code：B3I052030
Chinese Name：材料力学 A
English Name：Mechanics of Materials(A)
Term：Spring-Summer
Lecturer : Hua Liu
Credits/Hours： 5/64+16

Course type and main objectives

This course focuses on the strains, stresses, strengths, rigidities, stabilities, and failure criteria of materials under loads and offers the necessary theory for designing engineering structures from a material point of view. It is a fundamentalcoursein college of Engineering and taught in almost allcurricula related to mechanics, such as aeronautics, mechanical engineering and civil engineering. The prerequisite courses are Advanced Mathematics and Theoretical Mechanics. With this course of study, students are required to analyze the strength, rigidity and stability problems for a given member, have the ability to establish mechanical models for a practical problem and analyze them in a simple and logical manner.

Course Content

1. Introduction
2. Stress under axial loading, mechanical properties of materials
3. Deformations under Axial Loading
4. Torsion
5. Internal forces in bending
6. Bending stresses

7. Deflection of beams
8. Analysis of stress and strain
9. Strength of complex state of stresses
10. Combined loading
11. Buckling of columns
12. Further studies of bending problems
13. Strain-energy method
14. Analysis of statically indeterminate problems
15. Dynamic loading
16. Fatigue
17. Experimental stress analysis
18. Review

Syllabus of *Aerodynamics A*

Course Code：B3I052110
Course Chinese Name：空气动力学 A
Couse English Name：Aerodynamics A
Semester：Autumn Term
Credit /Hours：5/64(Theoretical Teaching)+16(Experiment)
Lecturer：Prof. Peiqing Liu,Written by Prof. Peiqing Liu

Course Aim

The course of 'Aerodynamics A' (also named as Fundamental of Aerodynamics) deals with the physical phenomena, the basic principles and the interaction between the air and objects. It is targeted to science and engineering students who, having had some basic exposure to fluid mechanics, wish to attain an overview of the different branches of fluid mechanics.

Our goal is to provide both a balanced introduction to all the tools used for solving fluid mechanics problems today and a foundation for further study of this important and exciting field. By learning about analytical, empirical (existing experimental data and accepted engineering practice), experimental (new experimental data, which will need to be obtained), and computational tools, students learn that an engineering problem can be approached in many different ways and on several different levels. This distinction of approach is especially important in fluid mechanics, where all these tools are used extensively.

Course Content

1. Introduction
2. Properties of fluid and fluid statics
3. Kinematics and dynamics of fluid flow
4. Viscous fluid flow

5. Fundamental of High-speed Compressible Flow
6. Aerodynamics of Low-speed Airfoil
7. Subsonic compressible flow over airfoil and wing
8. Aerodynamics of Supersonic Airfoil & Wing

Syllabus of *The basis of thermodynamics and heat transfer A(1)*

Course Code: B3I052120
Chinese Course Title: 热工基础 A（1）
English Course Title: The basis of thermodynamics and heat transfer A(1)
Lecturer: Xing Yuming
Credit / Class Hour: 4/64

Course Characteristics, Objective and Task

"The basis of thermodynamics and heat transfer basis A(1)" consists of two parts and they are engineering thermodynamics and heat transfer theory. It mainly introduces the work-heat transformation, heat energy utilization, heat engine principle and the knowledge of heat transfer laws. This course is the core curriculum aimed at the undergraduates in school of Aeronautics Science and Engineering.

The modern thermal basic knowledge has been involved in aeronautics and astronautics, biomedicine, electronic information engineering, machinery, metallurgy, chemical engineering, materials, environment, transportation engineering and other fields. It plays an important role in solving the technical problems related to thermal phenomenon in these areas. The modern thermal basic knowledge is essential for the modern engineering and it should be possessed by the technical professionals in twenty-first century.

The main contents of this course: (1) The basic concepts and basic laws of engineering thermodynamics, the thermal physical properties of common working medium, the basic thermodynamic process, typical thermodynamic cycle analysis and ways to improve the cycle efficiency are introduced in the part of engineering thermodynamics. (2) The basic laws of heat conduction, convection and radiation, the technical measures of controlling (strengthening or weakening) heat transfer process and the calculation method of heat exchanger are introduced in the part of heat transfer theory.

Curriculum Content

1. Introduction and basic concepts
2. Thermodynamic properties of gases

3. First law of thermodynamics
4. Thermodynamic process of ideal gas
5. The second law of thermodynamics
6. Water vapor and moist air
7. Flow of gas and steam
8. Power cycle
9. Refrigeration cycle
10. The basic theory of heat transfer
11. Heat conduction
12. Convective heat transfer
13. Radiant heat transfer

Science of Engineering Material

Course Code: B3I072310
Course Title (Chinese): 工程材料学
Course Title (English): Science of Engineering Material
Credits/Hours: 2/32(30(Hours in class)+2(Hours for experiments))
Lecturer: ZHANG Yanhua

The Nature, Purpose, and Goals of this Subject

This course is a fundamental principles of materials science and engineering. The course will address the fundamentals of structure-property-processing relationships in engineering materials and relate these fundamentals to the performance of the materials. Course topics will provide students the knowledge required to produce designs of mechanical components with appropriate material and process specifications. The general objectives for this subject are as follows:

1. To provide the student with an advanced understanding of the materials used in mechanical engineering.
2. Understand the properties of engineering materials, in particular the relation of the microstructure and mechanical properties
3. Students will be able to identify and explain the features in materials microstructure which affect various materials properties.
4. To provide the student a basic understanding of the main classes of engineering materials and applications in various mechanical components or structures.

Contents, Basic Requirements, and Class Hours Distribution

1. Introduction
2. Structure of Materials
3. Properties of engineering materials

4. Solidification and Phase Diagrams
5. Deformation of metallic materials.
6. Heat Treatment of steel
7. Ferrous Alloys
8. Non-Ferrous Alloys
9. Polymer and Ceramic

Syllabus of *Teaching Program for Electronic technology training*

Course Code： G32A2040
Course Title： Electronic technology training
Credit/Hours： 2/80
Lecturer： Zhang Wuqian、Cui Jian

The Purpose and Tasks of the Course

The course is a public compulsory course for engineering majors of undergraduate students. Through the course, students have a more comprehensive understanding of technologies on electronic circuit assembly, design and debugging process.

Students would learn skills on characteristics of electronic components, how to identify and detect components. They would getuseful skills on circuit soldering and necessary knowledge on instruments operating. At the end of the course, students should gain the abilities on circuit analysis, instruments operation and circuit board (PCB) designing.

Contents

1. Electronic assembly technology training
2. Electronic debugging technology training
3. soldering training
4. electronic component detecting
5. circuit assembly
6. circuit debugging training
7. report writing
8. 80 hours totally, final examination in the last

Syllabus of *Automatic Control Theory (B)*

Course Code : B3I053150/B3I053150L

Course Title : Automatic Control Theory (B)
The Semester of the Course : Autumn
Credit Hour/Course Time : 3/46
Lecturer: Dong Chaoyang

The Properties, Purposes and Tasks of the Course

The automatic control theory is the basic compulsory course of aircraft design, flight dynamic and flight security, human-machine and environmental engineering, Aircraft structural strength, vehicle aerodynamics et.al, and has been widely applied in the aero of engineering. It is the basic theory of automatic control. The main purposes of the course are making the students master the basic theory of automatic control and the basic knowledge of modern control theory. The various analysis methods should be investigated. The students should combine the theory and the practice, as well as obtaining practice ability by experiments. The course is the theory foundation of modern control, automatic control systems and computer control systems, et.al. The basic conceptions, theories, methods should be obtained by class teaching and practical teaching, the learning abilities and the creativity of the students should be improved.

The benefits of course are stated as follows: learn the basic conceptions of automatic control system and the history of automatic control theory; obtain the skills to construct, simplify and analysis the control systems; master the basic skill, which including the methods of the equivalent transform of structure graph, time domain analysis methods, complex domain analysis methods and the frequency domain analysis methods; the methods to integrated and correct the control systems should be obtained. Analysis and investigate the control systems based linear matrix inequality is important, which including the establishment, transformation and solution of the state equation, the definition and distinguishing methods of the controllability and observability of the control systems, the methods of state-feedback and pole-assignment; the students can analysis and compute the problems of control systems, accomplish the experiments independently.

Course Contents

1. the concepts of the control systems
2. the mathematical model of control systems
3. The performance index and stability of unit step response.
4. The characteristics of first order system and second order system.
5. The methods to analysis the performance of first order system and second order system.
6. The methods to determine the stability of the systems.
7. The methods to calculate the steady state error of the systems.
8. The applications of matlab in the time domain analysis.
9. The chapter 3 corresponds the index point 1.1 and 2.2.
10. The meaning of root locus.
11. The concepts of open-loop zero, open-loop pole, close-loop zero, close-loop pole, dominant pole and the dipole.
12. The concept of root locus equation.
13. The principles and methods to draw root locus.
14. The relationship between step response performance and zero pole distributuion.

15. The meaning, definition and calculation method of frequency characteristic.
16. Remember the frequency characteristic of typical links.
17. The methods to calculate the logarithm amplitude frequency characteristic and logarithm phase frequency characteristic.
18. The methods to calculate the transfer function with open loop logarithm amplitude frequency characteristic.
19. The summary of designing the control system.
20. Understand the basic laws of proportional control, proportional-integral control and proportional-integral-derivative control and their applications in practice.
21. Investigate the characteristic and effect of the familiar calibration methods.
22. Investigate the advantages and disadvantages of the calibration methods.
23. State-space analysis method
24. The concepts of state variable, state space, state equation, controllability and observability.
25. The relationship between state equation and transfer function.
26. The methods to draw the state-space diagram.
27. The methods to calculate the controllability canonical form and observability canonical form.

Syllabus of *Aircraft Conceptual/Preliminary Design*

Course Code ： B3I053111
Chinese Title of course： 飞机总体设计
English Title of course： Aircraft Conceptual/Preliminary Design
Lecturer： Sun Kangwen
Credit hours： 2.5/40+8

The Nature, the Purpose and Mission of the Course

Aircraft Conceptual/Preliminary Design is compulsory course for aircraft design professional student. The purpose of this course is to make the students to have deepened understanding of the method and technology about Aircraft general design, and through a comprehensive introduction of the aircraft conceptual design process to make students to understand the basic concepts, the main idea, the basic theory and method about Aircraft general design in this stage. So that students can fully understand the aircraft design is an iterative, repeatedly revised engineering problem. And this course uses lectures combined with seminar class teaching mode, fully mobilize the enthusiasm of students' Autonomous Learning. The important of course is to explain the flight design new concepts and new methods through the related design examples, and the mode of project continue to guide student to have the ability of autonomous learning through cooperate with the group, cultivate students' creative ability and team spirit, in order to make students can use knowledge solving problems proactively in the design team, and take the foundation of the design-related research or practical work in the future.

Course Content

1. Introduction
2. Design basis and preliminary parameter selection
3. The choice of aircraft conceptual design about plane layout
4. The design of landing gear
5. Power plant and fuel system
6. The aircraft design at low detectable
7. The overall layout of the plane
8. Parameter selection and trade studies
9. The first design show and discussed
10. Aircraft performance comprehensive analysis and evaluation
11. The second design show and discussed
12. The third design show and discussed
13. Economy and environmental protection is analyzed
14. Computer aided aircraft design technology
15. Multidisciplinary design optimization (MDO)
16. Course review and report

Syllabus of *Aircraft Structural Design*

COURSE CODE： B3I05312B
COURSE TITLE: Aircraft Structural Design
CREDITS/HOURS: 3.5/48+8
LECTURER: Prof. CHENG Xiaoquan

COURSE DESCRIPTION AND OBJECTIVE

Aircraft Structural Design is a key course for aircraft design specialty, which syncretizes materials, process, mechanics of materials, mechanics of structures, composite structure design, mechanics of flight, airframe structural layout, standards and specifications, various requirements, et al. This course contains aircraft loads, wing box structure, empennage structure, fuselage, landing gear, advanced composite structures and design ideas of airframe structures. Structure load transfer analysis, the choice of structural forms, structure layout and basic principles and methods of structure component design are important content.

The objective of this course is to let students understand the basic concept of aircraft structural analysis and design, the principles and methods of structural analysis, the characteristic of typical airframe structures, et al, and apprehend the fundament and methods of airframe structural design. Through this course, students should grasp load transfer analysis, the choice of structural forms, structure layout and basic principles and methods of structure component design in the airframe structural design. They can get hold of the primary inconsistency and have the ability to analyze complex problems synthetically. The students can establish a well-knit base for their future airframe structural working by this course.

Course Contents

1. General information
2. Ideas and methods of airframe structural design (4h)
3. Aircraft loads and design conditions
4. Wing and empennage structural analysis and design
5. Fuselage structural analysis and design
6. Landing devices
7. Composite structural design

Syllabus for *Mechanical Design*

Course Code:B3I073040
Course Title: Mechanical Design
Credits/Hours: 3/64 (Class hours 48+Experiment hours 6+Project design hours 10)
Lecturer: Zhili WANG,

The Nature, Purpose, and Goals of this Subject

Classification: Basic course in Mechanical Engineering

Goals: This is anadvancedtechnical course. It aims to provide the necessary mechanical design knowledge in the theories and methods by lecturing and discussing. By basic training on design conception and design skills, students are expected to study how to design a practical mechanical product, to improve the abilities of applying theories to engineering practice, to expand engineering knowledge, and to inspire innovative design.

Contents

1. Introduction
2. Shaft
3. Gear drive
4. Worm gear drive
5. Belt drive
6. Sliding bearing
7. Bolted connection
8. Keys & couplings
9. Rolling bearings
10. Design methods of general mechanical devices

Syllabus for *Theory of Elasticity*

COURSE CODE: B3I050511
COURSE TITLE: Theory of Elasticity (Taught by English)

LECTURER: GUO Zaoyang, CHEN Yuli, XU Jun
HOURS: 48

COURSE DESCRIPTION

Theory of elasticity is a fundamental course in solid mechanics. Based on the courses such as Statics and Dynamics, Mechanics of Materials, the basic concepts and basic assumptions of elasticity is introduced in this course. The basic equations in elasticity is derived. Then the basic theory for 2D problems is introduced and the basic methods for simple 2D problems in rectangular and polar coordinates are discussed. The variational methods are presented and the energy principles for elasticity are analyzed. After that, the basic theory for 3D problems is derived and the basic methods for simple 3D problems are studied.

Above all, the students will learn the basic theories and methods in elasticity in this course, and have a comprehensive understanding about 2D problems, axial-symmetric problems and torsion problems. It will then build a solid base for the students to learn advanced courses in solid mechanics.

COURSE OBJECTIVE

The course aims to teach students the basic concepts, theories and methods in elasticity based on the courses such as Statics and Dynamics, Mechanics of Materials. After learning this course, students should be able to solve simple 2D and 3D problems in elasticity. It will further improve the students' capability on the analysis of mechanical problems.

CONTENTS AND ARRANGEMENTS

1. Introduction
2. Basic theory for plane problems
3. Plane problems in rectangular coordinates
4. Plane problems in polar coordinates
5. Energy principles in elasticity
6. Solutions of 3D problems
7. Thin plate problems

Foundamentals of Vibration Mechanics

Course Code.: B3J050701
Course Title: Fundamentals of vibration Mechanics

Credit： 2
Lecturer： Xing Yufeng

Objective

The course of 'Foundation of vibration mechanics', based on the courses of 'theoretical mechanics', and 'materials mechanics', is a professional elective course. Through learning of this course, students can clearly understand the modal theory framework of the linear system, mastering several main methods of establishing dynamic differential equation, skillfully using modal superposition method to solve the responses of the free vibration and forced vibration, understanding the basic characteristics of the nonlinear system and its main analysis methods. In the process of teaching, the students will grasp the basic concepts of vibration mechanics clearly and basic analysis method for vibration problems through various teaching link gradually, and understand the concepts and methods which is closely related to engineering vibration problems.

This course mainly supports the following graduation requirements:
A Mastery of the basic theory and basic knowledge of mechanics

To master the concept of vibrational mode, etc., modal superposition method, etc, the ability use modal superposition method to analyze the free and forced vibration problems of discrete and continuous dynamics system.

Content

1. Overview
2. The vibration of single degree of freedom (DoF)system
3. The vibration of multi degree of freedom system
4. The vibration of continuous system
5. Approximate calculation method for linear systems
6. The free vibration and forced vibration of nonlinear system

Syllabus for *Fundamentals of Vibration Mechanics*

Course Code： B3J050701
Course Title： Fundamentals of vibration Mechanics
Credit/Class Hour： 2/32
Lecturer： Xing Yufeng

Course Objectives

The course of 'Foundation of vibration mechanics', based on the courses of 'theoretical mechanics', and 'materials mechanics', is a professional elective course. Through learning of this course, students can clearly understand the modal theory framework of the

linear system, mastering several main methods of establishing dynamic differential equation, skillfully using modal superposition method to solve the responses of the free vibration and forced vibration, understanding the basic characteristics of the nonlinear system and its main analysis methods.

In the process of teaching, the students will grasp the basic concepts of vibration mechanics clearly and basic analysis method for vibration problems through various teaching link gradually, and understand the concepts and methods which is closely related to engineering vibration problems.

The Teaching Content

1. The vibration of single degree of freedom (DoF)system
2. The vibration of multi degree of freedom system
3. The vibration of continuous system
4. Approximate calculation method for linear systems
5. The free vibration and forced vibration of nonlinear system

Syllabus for *Flight Dynamics*

Course No: B3I053160L
Course Title: Flight Dynamics
Semester: Spring
Credit/Hours: 2.5/40
Lecturer： Wang Lixin

Course Objectives

This course is one of the major courses for the students of Aircraft Design subject. The object is to train students to build flight motion equations with the knowledge of mathematics and mechanics;to understand the rules of flight movement and the basic theories of flight dynamics; to grasp the primary engineering approach of flight dynamics research.

This course mainly supports the following graduation requirements:

1. Understanding the basic knowledge of flight dynamics, and can solve the problem of aircraft flight performance, stability and control.
2. Using the basic principle of flight dynamics to solve the complex problems of aircraft flight dynamics.

Teaching Contents

1. Introduction and Point-Mass Equations of Aircraft
2. Basic Performace
3. Gliding Flight and Climbing Flight
4. Range and Endurance
5. Take-off and Landing

6. Aircraft Rigid-body Equations
7. Aircraft longitudinal equilibrium, static stability & control
8. Aircraft lateral equilibrium, static stability& control
9. Aircraft longitudinal movement stability & control
10. Aircraft lateral movement stability& control

Syllabus for *Structural Mechanics of Air Vehicles*

Course Code: B3I05313B
Course Title: structural mechanics of air vehicles
Credits/hours: 2/32
Lecturer: Guan Zhidong (关志东), Wu Zhigang (吴志刚)

Course Description

Structure is the assembly of elements wich can bear and transfer external loads. Structural mechanics is the discipline which study the mechanic characteristics of structures in air vehicles. The course is a key course for students of flight vehicle design and engineering.

The main contents include geometry invariability of structure, analysis of statically determinate and statically indeterminate structures, basic concepts of finite element method, route of force transmission, shear flow of open and closed thin-walled section, center of shear and torsional stiffness, and analysis of rod-plate combined structure.

After the course study, the students are expected to understand the basic theories of aircraft structure mechanics, master the basic skills of strength analysis for typical aircraft structures, and strengthen the foundation for subsequent courses. The course provides support for the following requirements of the undergraduates: 1) to master the basic theories and knowledge of aircraft design; 2) to master the analysis method of aircraft structure design.

Course Contents

1. Introduction
2. Structure of bar
3. Beam theory of stiffen thin-walled structure
4. Analysis of rod-plate combined structure
5.

Syllabus for *Helicopter Flight Performance, Control and Stability*

COURSE CODE: B3J05030AL
COURSE TITLE: Helicopter Flight Performance, Control and Stability
LECTURER: Cao Yihua
Course time: Spring
HOURS: 16
CREDITS: 1
TEAM L EADER: Cao Yihua

Course Description and Objectives

Helicopter is widely used in defense construction and civil transportation courses. This course is aimed at introducing the construction types of helicopter and corresponding aerodynamics and flight dynamics problems. This course can be used as the rotorcraft speciality and the related research course. This course is an important basic specialty course. Its task is to make students master the basic concepts of helicopter aerodynamic fundamental and flight mechanics. Also the course is aimed at cultivating the capability for analyzing and solving problems.

This course supports the following index of graduation requirements:

1. Master the basic concepts of helicopter aerodynamic fundamental and flight mechanics，and make an application to solving helicopter design engineering. It indicates the application to explaining the helicopter motion phenomenon.
2. Apply helicopter principle and basic research method to calculate trim, stability and control. It indicates mechanics analyses of force in helicopter trim, stability and control.

Contents and arrangements

1. Introduction
2. Reference Frames and Transformations
3. General Equations of Unsteady Motion
4. Rotor in Vertical Flight: Momentum Theory and Wake Analysis
5. Rotor in Vertical Flight: Element Theory
6. Rotor Aerodynamics in Forward Flight
7. Helicopter Performance and Trim
8. Dynamics of Hovering Flight
9. Dynamics of Forward Flight
10. Helicopter Stability and Control

Syllabus for *Overall Design Helicopter/Helicopter Preliminary Design*

Course Code: B3J05032AL
Course Title: overall Design Helicopter/Helicopter Preliminary Design
Credit/school: 1.5/24
Lecturer: professor Ming Chen

Course Nature, Purpose and Mission

Helicopter overall design is an important stage in the work of the development of the helicopter, the model of decisive significance to the success of the development, this course from the global perspective, analysis is introduced the basic principle of general design, main content and method, make the student to global helicopter and the overall design process have a whole understanding, trains the student to set up the correct design ideas. This course is divided into eight chapters, the first chapter mainly introduces the development situation and the characteristics of each design stage helicopter; The second chapter mainly introduces the basis of a helicopter design and evaluation criteria; Chapter 3 to chapter 8, respectively, it introduces the main content of the helicopter overall design, including the influence of main parameters and selection, pattern analysis and choice of aerodynamic layout and position arrangement. The content of chapter 9 in our school coaxial type helicopter research topic for the teaching background, introduced the main characteristics of coaxial type helicopter. The teaching material content in this chapter. This course is given priority to with lectures and discussions, arrange a controlled object and the scene teaching of the model.

Teaching Contents

1. Helicopter technology overview
2. Of the helicopter tactical technical requirements and design scheme evaluation criteria for
3. Of the third chapter the influence of main parameters in helicopter
4. Helicopters type analysis and choose
5. Helicopter main parameter choose
6. Engine option
7. Helicopter aerodynamic layout and arrange
8. Coaxial twin rotor helicopter design characteristics

Syllabus for *Computational Fluid Mechanics*

COURSE CODE: B3J05041AL
COURSE TITLE: Computational fluid mechanics
LECTURER: LAN Shilong
HOURS: 32
CREDITS: 2

Course Description

Computational Fluid Mechanics, same as Computational Fluid Dynamics(**CFD)**, is defined as the set of methodologies that enable the computer to provide us with a numerical *simulation* of fluid flows. We use the word '*simulation*' to indicate that we use the computer to solve numerically the laws that govern the movement of fluids, in or around a material system, where its geometry is also modeled on the computer. CFD are widely used by fluid mechanists, and even accepted as design tools by industrial users. At present, users of CFD need to be fairly knowledgeable, and the related education is necessary for them. The present course is an attempt to fill this need.

Course Objective

This course is designed to develop a basic understanding of algorithms of PDE and methods of practical value, such as methods for the Euler and Navier-Stokes equations in applications, in addition, to build a solid background for properly utilization of current popular CFD softwares.

Contents and Arrangements

1. Basic concepts of fluid flow
2. Introduction to numerical methods
3. Finite difference method
4. Finite volume method
5. Solution of linear equation systems
6. Methods for unsteady problems
7. Solution of Navier-Stokes equations
8. Complex geometries
9. Turbulent flows

Syllabus for *Experimental Fluid Mechanics*

COURSE CODE: B3J05044AL
COURSE TITLE: Experimental Fluid Mechanics
SEMESTER: Spring
CREDITS/HOURS: 2/24+8
LECTURER: GAO, Qi

COURSE DESCRIPTION

Experimental fluid mechanics is an important subject of fluid mechanics. The course covers basic concepts of fluid mechanics, introduces techniques of flow visualization and quantitative measurement, and makes the students know about the principles of measurements and their typical applications. For mastering some basic experiment methods, two laboratories are arranged for optical measurements (particle image velocimetry and laser Doppler

velocimetry), which let the students learn the details of experiment procedures. Approaches of data analysis are also introduced in the course.

The course supports the students' core capabilities for graduation:

A. Basic theory and knowledge of mechanics.

C. Basic capability of engineering application.

E. Familiarity with the theoretical frontiers, application prospects and developing trends of engineering mechanics, and bearing the sense of innovation.

F. Basic methods of literature search and certain scientific research and practical work abilities.

CONTENTS AND ARRANGEMENTS

1. Introduction
2. Similarity theorem
3. Chapter 3 Flow visualization
4. Chapter 4 Hot wire anemometer
5. Chapter 5 Laser measurement techniques
6. Data analysis

Syllabus for *Fracture & Damage Mechanics*

Course Code: B3J050531
Course name: Fracture & Damage Mechanics
Credits/hours: 2/32
Responsible professor:
Drafter: ZHANG Zheng

Course Type and Main Objectives

This course is a specialized course for mechanical engineering and structure specialty in Colleges and universities, and also an important theory for application. Fatigue fracture problem is an extensively common problem in engineering, which is critical to ensure the structural function and safety. The study of this course has valuable meaning and function to analyze and solve this kind of potential dangers in engineering.

The task of this course is to make students understand the basic properties of material / structural fracture damage, to grasp the basic method of fracture damage analysis, and cultivate students' theoretical quality, thinking mode and analytical ability, which lays a solid foundation for scientific and engineering research in future.

Course Content

1. Introduction of fracture mechanics
2. Theoretical system of fracture mechanics

3. Analysis of crack propagation
4. Elastic-plastic crack tip field: J - integral
5. Monotonic and cyclic loading
6. The origin and development of damage mechanics
7. Damage evolution equation and determination of material damage parameters
8. Anisotropic damage evolution
9. Elastic-plastic crack tip damage field
10. The unification of fracture mechanics and damage mechanics
11. Damage mechanics-finite element method

Syllabus for *Mechanics of Composite Materials*

Course Code： B3J050581
Course Title： Mechanics of Composite Materials
Credits/Hours： 2/32
Professor of responsibility: Deyu Cui
Author： Yuxin Sun

Property, Purpose and Mission of the Course

This course balances introduction to the basic concepts of the mechanical behavior of composite materials and laminated composite structures. It covers topics from micromechanics and micromechanics to lamination theory and plate bending, buckling, and vibration, clarifying the physical significance of composite materials. This course is given in full-English and can help students in mastering professional English.

This course supports the following Students' Core Capabilities

A. Basic theory and knowledge of mechanics.
C. Basic capability of engineering application.
E. Familiarity with the theoretical frontiers, application prospects and developing trends of engineering mechanics, and bearing the sense of innovation.

Main Content, Basic Requirement and Hours Arrangement

1. Introduction to Composite Materials
2. Macromechanical analysis of a lamina
3. Micromechanical analysis of a lamina
4. Micromechanical analysis of a lamina
5. Strength and stiffness of laminates

Syllabus for *Finite Element Analysis in Engineering*

Course Code： B3J050611

Course Title： Finite Element Analysis in Engineering
Credits/Hours： 2/32
Professor of responsibility: Deyu Cui
Author： Yuxin Sun

Property, Purpose and Mission of the Course

This course presents the necessary concepts, principles and general procedure of Finite Element Method（FEM）which are primarily applied for linearly elastic structural analysis including plane problems, axisymmetric problems, space problems, plates and shells and fracture mechanics. The aim of the course is to provide the fundamental theories and numerical methodology in finite element analysis. This course is given in full-English and can help students in mastering professional English.

This course supports the following Students' Core Capabilities

A. Basic theory and knowledge of mechanics.
C. Basic capability of engineering application.
E. Familiarity with the theoretical frontiers, application prospects and developing trends of engineering mechanics, and bearing the sense of innovation.

Main Content, Basic Requirement and Hours Arrangement

1. Introduction to Finite Element Method
2. General Procedure of Finite Element Method
3. Formulation of Isoparametric Finite Element Matrices
4. Stress Analysis of Axisymmetric Problems
5. Analysis of Three-dimensional Problems
6. Finite Element Analysis for Plates and Shells

Syllabus for *Introduction to Finite Elements in Engineering*

Course Code： B3J050691
Course Title： Introduction to Finite Elements in Engineering
Semester： Spring-summer
Creditshour/Class hour： 2/32
Responsibility Professor： Tong Zhang
Author： Tong Zhang

Course Objects and Outcomes

Finite Element Method is a powerful engineering analysis tool, and has been widely used in engineering since it was introduced in the 1950s. This course presents the basic theory and simple application of Finite Element Method (FEM) along with common FEM terminology. The emphasis of this course is on the fundamental concepts of finite element analysis. This course includes a multiple-choice quiz at the end, which is designed to enhance the

understanding of course materials.

To achieve fundamental understanding of the subject of finite element analysis and apply it to diverse problems in Aerospace, Civil, and Mechanical engineering. Many engineering problems have complicated geometry and boundary conditions, which makes it impossible to come up with a closed-form solution. Therefore, numerical method such as Finite Element Method, was introduced to provide approximate solutions to complicated engineering problems through the use of a computer. Because FEM can be adapted to problems of great complexity and unusual geometry using grid or mesh, it is an extremely powerful tool for solving critical problems in heat transfer, fluid mechanics, electrostatics, and structural and mechanical systems. Furthermore, the availability of fast and inexpensive computers allows engineers and architects to solve daily engineering problems in a straightforward manner using Finite Element Method.

Course Contents

1. Basic concepts
2. The basis of linear algebra
3. One dimensional problems
4. Trusses
5. Constant strain triangle element and the two-dimensional problems by FEM
6. Axially-symmetry problem
7. Isoparameter element and numerical quadrature
8. Beam and frame structures
9. The analysis of stress in three dimension

Syllabus for *Aeroelastic Design*

Course Code： B3J05025AL
Course Title： Aeroelastic Design
Credits/Hours： 1/16
Lecturer： Xie Changchuan

Course Character, Objective And Task

The Aeroelastic Design, course code F05D4130/ F05D4131, is an elective special course for the third-year undergraduate students in the major of aircraft design. Aeroelasticity is the study of static and dynamic behavior of elastic structures, especially of an air vehicle and its components, in a flowing air. The aim of this course is to make students understand the important aeroelastic phenomena of aircraft and the basic concepts of aeroelasticity. Then some simple practice problems in aircraft design will be introduced. Based on the foundation knowledge of aeroelasticity, the design factors affecting the aeroelastic characters will be abstracted to avoid the harmed phenomena in aircraft design.

The aeroelasticity is a kind of applied mechanics crossing many difference disciplines, including

structure mechanics, aerodynamics, control theory and so on. It is preferred that the students selecting this course have taken the relative courses in advance, although it is not prerequisite for an abbreviated course. Some necessary knowledge will be introduced briefly before it is used in the course.

The course aims to introduce the basic concepts, the calculation theories and engineering design methods of aeroelasticity in aircraft design. It is supposed to promote the abilities of students in following three aspects: 1) solving the practice problems applying the knowledge taught in class; 2) the synthesis capability of different disciplines; 3) the cognition of analyzing systemically in aircraft design.

Content

1. Introduction
2. Static Aeroelasticity of 2D Wing Segment
3. Static Aeroelasticity Of Slender wing
4. Matrix Method Of Static Aeroelasticity
5. Flutter and Response of 2D Wing Segment
6. Elements of Unsteady Aerodynamics
7. Engineering Method for Dynamic Aeroelasticity
8. Research Areas of Aeroelasticity

Syllabus for *Fundamentals of Hypersonic Aerodynamics*

COURSE CODE: B3J05040AL
COURSE TITLE: Fundamentals of Hypersonic Aerodynamics
LECTURER: Zou Hui
HOURS: 32
CREDITS: 2

COURSE DESCRIPTION

Hypersonic Aerodynamics is an important part of the entire flight spectrum, representing the segment at the extreme high velocity of this spectrum. This course is divided into three parts. Part 1 deals with inviscid hypersonic flow, emphasizing purely the fluid dynamic effects of the Mach number becoming large. Part 2 deals with viscous hypersonic flow, emphasizing the purely fluid dynamic effects of including the transport phenomena of viscosity and thermal conduction at the same time that the mach number becomes large. Part 3 deals with the influence of high temperature on both inviscid and viscous flows through the various physical phenomena that dominate high-speed aerodynamics.

COURSE OBJECTIVE

The course introduces the basic theory of Hypersonic Aerodynamics. This course is

aimed to be professional working tool for the jobs with hypersonic and/or high- temperature flow. Hypersonic Aerodynamics is an important part of the entire flight spectrum, representing the segment at the extreme high velocity of this spectrum.

CONTENTS

1. Introduction,
2. Hypersonic aerodynamic characteristics,

1) physical phenomeno
2) flight path

3.Inviscid hypersonic Flow

1) Basic hypersonic shock and expansion relations
2) Local surface inclination methods
3) Flowfield considerations
4) Design of waveriders
5) Modern computational approaches; Euler equations

4. Viscous hypersonic Flow,

1) Basic aspects
2) Simpler solutions for hypersonic viscous flows
3) Hypersonic transition and turbulent boundary layers
4) Strong and weak viscous interactions

Syllabus for *Theory and Practice of Molecular Dynamic Simulation for Beginners*

Course ID: B3J050561
Course Title: Theory and Practice of Molecular Dynamic Simulation for Beginners
Credits / Hours: 2/32
Lecturer: Bo Liu

The Nature，Purpose and Mission of The Course

Theory and Practice of Molecular Dynamic Simulation for Beginners is an important elective course for undergraduate students of engineering mechanics. This contents of the course include:
(1) The application, significance and trends of molecular dynamics (MD) simulation
(2) Physical model of molecules
(3) Interactions between molecular
(4) Common molecular field
(5) The equations of motion and numerical solution of molecular systems
(6) The skills of molecular dynamics simulation

(7) The basis of statistical mechanics MD simulations
(8) The first principles of molecular dynamics simulation
(9) Application of molecular dynamics simulation

Contents of the Course

1. Introduction
2. The Physical Model of Molecules
3. Interactions between Molecular
4. Common Molecular Field
5. The Equations of Motion and Numerical Solution of Molecular Systems
6. The Skills of Molecular Dynamics Simulation
7. Basis of Statistical Mechanics in MD Simulation
8. The First Principles of Molecular Dynamics Simulation
9. Application of Molecular Dynamics Simulation

Bachelor Program of Mechanical Engineering

（In English）

“机械工程专业”本科培养方案（英文授课）

培养方案

(This document is the text compression version of the same major taught in Chinese and only for international students)

School of Mechanical Engineering and Automation & International School

Beihang University, Beijing, China

北京航空航天大学机械工程及自动化学院 & 国际学院

September, 2015

Bachelor Program of Mechanical Engineering (In English)

机械工程专业本科培养方案（全英文授课）

一、 学院简介

I. Introduction of School of Mechanical Engineering and Automation

北京航空航天大学机械工程及自动化学院历史悠久，可追溯到 1952 年北航建校时创建的飞机工艺、发动机工艺专业教研室，1978 年后建立了制造工程系和机电工程系，1998 年 4 月 28 日，制造工程系和机电工程系合并，组建成立了机械工程及自动化学院，是北京航空航天大学最具实力的学院之一。学院学科覆盖了 5 个一级学科：机械工程、航空宇航科学与技术和材料科学与工程 3 个国家重点一级学科，船舶与海洋工程、设计学 2 个一级学科。下设有机械制造及其自动化、机械电子工程、机械设计及理论、工业与制造系统工程、航空宇航制造工程和材料加工工程、船舶与海洋结构物设计制造和工业设计等 7 个二级学科。学院设有机械工程和工业设计 2 个本科专业。

With a rich history, the School of Mechanical Engineering and Automation was originally from the Departments of Aeroplane Technology and Engine Technology since Beihang University was established in 1952.In 1978, Department of Manufacturing Engineering and Department of Electronic Engineering were built, which were then merged together on April 28th 1998 to form the School of Mechanical Engineering and Automation, one of the most powerful school at Beihang University. The school has five first-level disciplines including three key national first-level disciplines (Mechanical Engineering, Aeronautical and Astronautical Science and Technology, Material Science and Engineering) and two ordinary first-level disciplines (Naval Architecture and Marine Engineering, and Science of Design).Those first-level disciplines cover seven second-level disciplines, In addition, the school has two undergraduate programs, which are Mechanical Engineering and Industrial Design.

学院师资力量雄厚，在编在岗教职工有 170 人，其中教授 49 人，副高 63 人，博导 43 人。目前学院全日制在校学生近 2000 人，其中本科生 800 余人、硕士生 750 余人、博士生 350 余人、留学生 20 余人。培养目标定位于面向国防科技工业和现代制造业、面向未来发展，具有创新品质、综合素质高、适应能力强的高级专门人才。本科教学强调理论与实践结合，注重培养学生的工程实践与创新能力；本科课程突出航空航天特色，形成了机电信相融合的教学体系。2006 年国内率先通过了“机械工程专业工程教育认证”。2008 年以来，机械工程专业获得教育部“专业综合改革试点”、“卓越工程师教育培养计划”、“国家级与北京市特色专业”、以及“工信部重点专业”等。《工程图学》为国家级精品课程，《机械设计》等 3 门为北京市精品课程，《测试技术基础》等 6 门为校级精品课程。

The school has a strong and competent faculty team which is composed of 170 academic staffs including 49 professors, 63 associate professors, of which 63 are PhD supervisors, and 85.5% have PhD degrees. The school has a capacity about of 2000 students that include 800 undergraduates, 750 postgraduates and 350 PhD students, of which 20 are international students. The school’s academic program is targeting at training high-grade special talented persons with innovative character, high overall

quality and high adaptability, facing the future development of defense science & technology industry and modern manufacturing. Undergraduate lecturing is highlighted in the combination of theory and practice, with a particular emphasis in engineering practice and innovation ability. Undergraduate curriculum features aviation and aerospace, forming a systematic integration of mechanical engineering, electrical and electronic engineering, and information engineering. In 2006, the school first passed the “Accreditation in Mechanical Engineering Professional Engineering Education” in China. Since 2008, the major of Mechanical Engineering has achieved several honors conferred by the Department of Education, such as " Professional comprehensive reform experimental unit "," Excellent engineer education and training program "," National and Beijing's characteristic specialty "and "Key majors of MIIT" ect. Engineering Graphics is a national fine course, Mechanical Design and other two courses are Beijing's fine courses, and Fundamentals Measurement Technology and other 5 courses are fine courses in Beihang University.

学院以人才培养为核心，坚持教学与科研紧密结合，在现代机构学及先进机器人技术、航空先进制造技术及工艺装备、高性能整体构件一体化成形及连接技术、机电控制及检测技术、数字化集成制造与信息化管理、以及微纳制造与生物加工等学科交叉前沿理论与技术等方向上形成了自己的特色和优势。已建有数字化设计与制造技术北京市重点实验室、飞行器装配机器人装备北京市重点实验室、国防科技工业高效数控加工技术研究应用中心、机械工业数控加工工艺技术与装备工程实验室、中国机械工业联合会机械工业服务机器人技术重点实验室等一批重点实验室/研究中心；

The school adheres to the combination of teaching and research focusing on training the talented-person. It has formed its own features and advantages in interdisciplinary cutting-edge theories and technologies such as Modern Mechanisms and Advanced Robotics, Aviation Technology and Advanced Manufacturing Technology and Process Equipment, High-performance Whole-part Monolithic Forming and Connection Technology, Mechatronic Control and Detection Technology, Digital Integrated Manufacturing and Information Management, and Micro-/Nano- Manufacturing and Bioprocessing. The school has established a series of key laboratories and research centers such as the Digital Design and Manufacturing Technology Key Lab in Beijing City, AircraftAssembly Robot Equipment Key Lab in Beijing City, Defense Industry and Efficient CNC Machining Technology Research and Application Center, Machinery Industry CNC Machining Technology and Equipment Engineering Laboratory, Machinery Industry Service Robotics Laboratory of China Machinery Industry Federation.

二、 培养目标

II. Educational Objectives

针对留学生的教育背景、认知特点及发展需求，培养具有良好的科学、人文素养，掌握扎实的自然科学基础知识、必备的机械工程专业知识与技能，具有从事设计制造、科技开发、工程应用及经济管理等方面的工作能力，敢于面对未来挑战，富有创新潜质，具备团队精神，善于学习实践的高级工程技术人才。

Aiming at the educational background, cognitive characteristics and development requirement of international undergraduates, this program aims to develop students with good science and human quality who can firmly grasp the basic theory, specialized knowledge and basic skills of mechanical engineering to have the work ability in related fields of mechanical engineering including designing and manufacturing, technology development, engineering applications and economic management and so on. Students have innovative potential and team-work spirit to face future challenges and they are good at study and practice who will be senior engineering and technical personnel.

三、 毕业要求

III. Degree Requirements

来华留学生应具有一定的基础汉语水平，了解中国法律法规、传统文化和风俗习惯等，热爱母校，亲华、知华、优华。

Foreign students in China should have a certain level of basic Chinese, Understanding of Chinese laws and regulations, traditional culture and customs etc., and loving alma mater, knowing China, and loving China.

专业方面，

As regarding the professional skills

（1）掌握从事机械工程专业相关工作所需的数学、自然科学、工程基础知识，能够将所学知识用来分析及解决复杂机械工程问题；

Capable of mastering knowledge in mathematics, natural science, basic engineering and professional knowledge and capable of applying mathematics, natural sciences basic principles to analyze and solve complicated mechanical engineering problems.

（2）掌握机械工程专业的基本理论和工程基础知识，了解本专业的前沿发展现状和趋势；掌握现代设计理论与技术、先进机械制造技术与装备以及机电液控技术等本专业科学理论；

Capable of solving complex mechanical engineering problems using scientific methods based on scientific principles, including experiments design, data analysis and information synthesis to obtain reasonable and valid conclusions.

（3）能够运用各种设计、分析等现代化工程工具软件和信息技术手段；可以综合运用所学的基础知识、专业知识和工程技能设计、组织和实施工程实验，并能够利用科学方法对实验结果进行分析、总结和归纳，得出合理有效的结论；

Capable of developing, selecting and applying reasonable and effective technology, resources, modern engineering tools and information technology tools with understanding their limitations during the practice of mechanical engineering.

（4）具有追求创新的态度和意识，掌握基本的创新方法，以及综合运用理论和技术手段设计复杂机械系统与过程的能力；设计过程中能够综合考虑社会、经济、文化、环境、法律、安全、健康、伦理等制约因素；

Pursue innovative attitude and consciousness, master the basic innovation methods, capable of designing complex mechanical systems and processes using operational theory and techniques methods, by

considering social, economic, cultural, environmental, legal, security, health and ethical constraint factors during the design process.

（5）能够基于机械工程相关背景知识进行合理分析，评价专业工程实践和复杂工程问题解决方案；

Capable of analyzing rationally, evaluating professional engineering practice, and designing solutions for complex mechanical engineering problems while considering the background knowledge relating to mechanical engineering.

（6）具有人文社会科学素养、社会责任感，能够在机械工程实践中理解并遵守工程职业道德和规范；

Possess humanities social science literacy, social responsibility; have good physical and mental qualities.

（7）能够就复杂机械工程问题与业界同行及社会公众进行有效沟通和交流，并具备较强的国际视野；

Capable of performing effective communication and exchange on complex mechanical engineering problems with industry peers and the public, both written and verbal, and have international perspective ability to work as part in a multi-disciplinary team.

（8）能够在跨文化背景下进行沟通和交流；

Capable of completing communication under multicultural environments.

（9）具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

Possess consciousness of self-learning and lifelong learning in order to adapt the development.

四、 学制、学位

IV. Study Period

学制：四年

Study Period：4 Years， Maximum: 6 Years (not including military service time)

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

五、 专业特色

V. Characteristics

本专业按机械工程大类培养“科学型与工程型相结合”的宽口径人才，秉承“研教融合”的办学理念，依托学校、学院已有教学、科研优势资源，注重系统级知识体系的建立并强调“大机械”通识教育，鼓励学生跨专业跨学科学习。本专业重视未来高水平人才所应具有的人文素养，强化数理知识及学科基础理论；专业课程以机为主、机电结合，突出航空航天特色，注重工程实践能力的培养。

This program aims to train science and engineering combined type of adaptable talent in terms of a unified mechanical engineering category. It emphasizes humanities that high-level professional personnel, strengthens mathematical knowledge and discipline basic theory, adheres to the Research & Teaching philosophy, relies on existing courses advantages to construct and optimize professional courses, focuses on the establishment of system-level knowledge systems and emphasizes the "big machines" general education, encourages students to interdisciplinary learning, which reflect the characteristics of research universities.

六、 主干学科

VI. Main Disciplines

- 力学
  Mechanics
- 机械工程
  Mechanical Engineering

七、 课程体系

VII. Program Structure and Modules

共分为三个课程模块：基础课程、语言及文化课程、通识课程和专业课程。

There are three course modules: Foundation Courses, General Education (GE) Courses and Major Courses.

表 1 课程体系及各课程类别的最低学分要求示意图

Table 1 The Credit Requirement (Minimum) of each Course Type for Bachelor in Mechanical Engineering

课程模块 **Course Module**	**Order**	课程类别 **Course Type**	学分 **Credits**
I 基础课程 Foundation Courses (FC)	A	数学与自然科学类 Mathematics and Natural Sciences (MNA)	31.0
	B	工程基础类 Engineering Fundamentals (EF)	12.5
	C	语言和文化 Language and Culture (LC)	10.0
II 通识课程 General Education Courses (GE)	D	思政类 Ideology and Politics (IP)	——
		军理类 Military Theory (MT)	——
	E	体育类 Physical Education (PE)	--
	F	核心通识课程 Core GE Courses (C-GE)	2.0
	G	一般通识课程 General GE Courses (G-GE)	2.0
II 通识课程	H	博雅类	--

General Education Courses (GE)		Liberal Arts (LA)	
III 专业课程 Major Courses (MC)	I	核心专业基础课 Core Major Course (C-MC)	70.0
	J	一般专业课 General Major Course (G-MC)	
	L	专业实践课 Practical Major Course (PMC)	

基础课程模块，主要包括数学与自然科学类（如数学、物理等）、工基础类（如机械和电子工程训练、C 语言编程等），以及语言类。其中，《汉语》和《中国概况》是来华留学英文授课本科生的必修课。通识课程模块，旨在培养和提高学生在人文、社科等方面的知识和修养。

Foundation Courses (FC) include Mathematics and Natural Sciences courses (Mathematics, Physics, etc.), Engineering Fundamentals courses (Mechanism, Electronics Engineering, C language, etc.). Language courses include Chinese courses for oversea student studied in China. General Education courses are courses to improve knowledge and cultivation in humanities and social sciences.

博雅类主要含暑期学校和社会实践

Liberal Arts (LA) mainly include summer school course and social practice course.

专业课程模块，分为专业基础课程、实践课程（含毕业设计）、专业核心课程以及一般专业选修课程。学生可根据个人的兴趣及发展方向，在学业指导老师的指导下学习。

Major courses are divided into Fundamental Major Course, Major-oriented Course, General Major Courses and Practical Major Courses (including Graduation Project). The students can select based on their own interest and direction under the guidance of school academic advisors.

八、 主要课程

VIII. Main Major courses

理论力学、材料力学、电工电子技术、工程材料学、画法几何、机械制图、机械原理、机械设计、热工基础、制造工程基础、流体传动、机电控制工程基础、机电传动控制、机电一体化系统设计与实践、测试技术基础、机械设计综合实践。

Theoretical Mechanics, Mechanics of Materials, Electrical and Electronics, The Science of Engineering Materials, Descriptive Geometry, Machine Drawing, Theory to Machines and Mechanisms, Mechanical Design, Fundaments of Thermodynamics and Heat Transfer, Fundamentals of Manufacturing Engineering, Hydraulic Transmission, Fundamental of Electromechanical Control Engineering, Electromechanical Transmission Control, Mechatronics Design and Practice, Fundamental of Measurement Technology, Practice of Mechanical Design.

九、 主要实践教学环节及安排

IX. Main Internship and Practical (Including experiments)

基础物理实验、机械工程技术训练、电子工程技术训练、C 语言程序设计与实践、机械设计综合实践、机电一体化系统设计与实践、专业综合实践、毕业设计

Fundamental Physics Experiments, Mechanical Technology Practice, Electronic Technology Practice, C Programming Language Design and Practice, Practice of Mechanical Design, Mechatronics Design and Practice, Comprehensive Specialty Practice, Graduation Thesis.

表 2 实践课程清单

Table2 Practical Courses

序号 No.	课程名称 Course Title	课程类别 Course Type	开课学期 Semester	学分 Credits	总学时 Hours
1	C 语言程序设计与实践 C Programming Language Design and Practice	B（EF）	2	2.5	48
2	机械工程技术训练 A Mechanical Technology Practice A	B(EF)	2	3.5	140
3	基础物理实验 B (1)# Fundamental Physics Experiments B (1)	A(MNA)	3	1.5	28
4	电子工程技术训练 Electronic Technology Practice	B(EF)	4	1.5	80
5	基础物理实验 B (2)# Fundamental Physics Experiments B (2)	A(MNA)	4	1.5	24
6	机械设计综合实践 A Practice of Mechanical Design A	C-MC	6	3.0	3weeks
7	机电一体化系统设计与实践 Mechatronics Design and Practice	C-MC	6	2.0	2weeks
8	专业综合实践 Comprehensive Specialty Practice	C-MC	7	2.0	2weeks
9	毕业设计 Graduate Project	PMC	8	8.0	16 weeks

十、 毕业最低学分

X. Minimum Required for Graduation

毕业最低学分要求：在满足各课程类别最低学分的要求下，总学分不低于 125 学分。

Minimum Required for Graduation=125 credits, and meet the credit requirement of each Course Type at the same time.

十一、 教学进程计划

XI. Education Curriculum

the 1st Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09A101I	工科高等数学#(1) Advanced Mathematics for Engineering (1)	90	6.0	Compulsory	MNA	Examination
B25D111I	中国概况 Introduction to China	32	2.0	Compulsory	LC	Examination
B1C251131L	汉语 (1) Chinese (1)	64	4.0	Compulsory	LC	Examination
C05D101I	航空航天概论 B Introduction to Aeronautics and Astronautics B	32	2.0	Compulsory	C-GE	Examination
C06D101I	大学计算机基础 University Computer Foundation	44	2.0	Compulsory	G-GE	Examination
E07D101I	机械工程导论 Introduction to Mechanical Engineering	32	2.0	Compulsory	G-MC	Examination
E05B1030	工程图学 B	64	4.0	Compulsory	C-MC	Examination
	学期学分小计 Semester Credits		22.5			

the 2nd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09A102I	工科高等数学 (2) Advanced Algebra for Engineering (2)	86	5.0	Compulsory	MNA	Examination
A09A103I	工科高等代数 Advanced Algebra	90	6.0	Compulsory	MNA	Examination
A19A101I	工科大学物理 (1) University Physics for Engineering (I)	64	4.0	Compulsory	MNA	Examination
B1C251141L	汉语#(2) Chinese (2)	64	4.0	Compulsory	LC	Examination
B1B071210	C 语言程序设计与实践 C Programming Language Design and Practice	48	2.5	Compulsory	EF	Examination
	学期学分小计 Semester Credits		21.5			

the 3rd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09B204I	概率统计 A Probability Statistics B	48	3.0	Compulsory	MNA	Examination
A19A202I	工科大学物理 (2) University Physics for Engineering (2)	64	4.0	Compulsory	MNA	Examination
A19A103I	基础物理实验 B(1)# Fundamental Physics Experiments B(1)	28	1.5	Compulsory	MNA	Examination
B3I032060	电工电子技术 Electrical and Electronics	72	4.5	Compulsory	C-MC	Examination
E05B201I	理论力学 A(1)# Theoretical Mechanics A(I)	64	4.0	Compulsory	C-MC	Examination

G32A201I	机械工程技术训练 A Mechanical Technology Practice A	140	3.5	Compulsory	EF	Test
	学期学分小计 Semester Credits		20.5			

the 4th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A19A104I	基础物理实验 B(2)# Fundamental Physics Experiments B(II)	24	1.5	Compulsory	MNA	Examination
E05B204I	材料力学 A Mechanics of Materials A	64+16	5.0	Compulsory	C-MC	Examination
E05B202I	理论力学 A(2) Theoretical Mechanics A(II)	26	1.5	Compulsory	C-MC	Examination
E07B203I	机械设计基础 A(1) Fundamentals of Mechanical Design A(1)	54	2.5	Compulsory	C-MC	Examination
E07B211I	工程材料学 The Science of Engineering Materials	34	2.0	Compulsory	C-MC	Examination
B3I072110	热工基础 Fundaments of Thermodynamics and Heat Transfer	32	2.0	Compulsory	C-MC	Examination
G32A204I	电子工程技术训练 Electronic Technology Practice	80	2.0	Compulsory	EF	Test
	学期学分小计 Semester Credits		16.5			

the 5th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3I073410	机电控制工程基础 Fundamental of Electromechanical Control Engineering	40	2.5	Compulsory	C-MC	Examination
E07B304I	机械设计基础 A(2) Fundamentals of Mechanical Design A(1)	64	3.0	Compulsory	C-MC	Examination
E07B313I	制造工程基础 Fundamentals of Manufacturing Engineering	48	3.0	Compulsory	C-MC	Examination
E07D321I	流体传动 Hydraulic Transmission	38	2.5	Compulsory	C-MC	Examination
B3I073420	机电传动控制 Electromechanical Transmission Control	40	2.0	Compulsory	C-MC	Examination
	学期学分小计 Semester Credits		13.0			

the 6th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E07B314I	机器人技术基础 Fundamentals of Robotics	46	2.5	Compulsory	G-MC	Examination
E07D309I	机械设计综合实践 A Practice of Mechanical Design A	120	3.0	Compulsory	C-MC	Examination
E07B316I	测试技术基础 Fundamental of Measurement Technology	34	2.0	Compulsory	C-MC	Examination
E07B315I	机电一体化系统设计与实践 Mechatronics Design and Practice	32	2.0	Compulsory	C-MC	Examination
F07C422I	先进加工技术及装备 Advanced Processing Technology and Equipment	48	3.0	Compulsory	G-MC	Examination
	学期学分小计		12.5			

	Semester Credits					

the 7th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
F07C412I	机械设计学 Philosophy of Mechanical Design	32	2.0	Compulsory	C-MC	Examination
F07C443I	计算机辅助制造 Computer Aided Manufacturing	48	3.0	Compulsory	C-MC	Examination
F07C321I	机械制造工艺 Machine-Building Technology	48	3.0	Compulsory	C-MC	Examination
F07C881I	计算机控制系统 Computer Control System	32	2.0	Compulsory	C-MC	Examination
G07D412I	专业综合实践 Comprehensive Specialty Practice	80	2.0	Compulsory	PMC	Examination
	学期学分小计 Semester Credits		12.0			

the 8th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
G07D4010	毕业设计 Graduation Thesis	16weeks	8.0	Compulsory	PC	Test

备注：

(1) 只列出各学期必修课程目录

Only compulsory courses are listed

(2) **课程类别的相关说明**

Explanation of course type:

数学与自然科学类 Mathematics and Natural Sciences (MNA)
工程基础类 Engineering Fundamentals (EF)
语言和文化 Language and Culture (LC)
核心通识课程 Core GE Courses (C-GE)
一般通识 General GE Courses (G-GE)
核心专业基础课 Core Major Courses(C-MC)
一般专业课 General Major Course(G-MC)
专业实践课 Practical Major Course (PMC)

如下课程留学生可选修：

Other courses student can select

Course Type	Title	Credits	Note
PE	体育课(1) Physical Education	0.5 Credit/Semester	International students can select from the 2nd semester.
LA	文化素质拓展 Culture Quality Developing	1.0 Credit/Semester	International students can select from the 3rd semester.

G-GE	暑期学校系列课程 Courses in Summer Camp	Max 6.0 Credits /Summer Semester	International students can select the courses in summer semester (3rd semester) during the 2nd or the 3rd academic year.
G-GE	专业英语阅读与写作 Professional English Reading and Writing	2.0 Credits/Semester	International student can select since 5th semester.
	社会实践 Social Practice	1.0 Credit	
	汉语水平考试 HSK	1.0 credit	One credit will be offered if the international student passed HSK 3 or over.
	其他课程 Other Courses		See the time-table at the beginning of each semester.

十二、 联系方式

XII. Contact Detail

Address: International School, Beihang University
37 Xueyuan Rd. Haidian District, Beijing, China
Post Code: 100191
Tel: 86-10-82316488 86-10-82339165
Fax: 86-10-82339165 86-10-82339326
E-mail: fso@buaa.edu.cn admission@buaa.edu.cn
Web Site: http://www.buaa.edu.cn
http://is.buaa.edu.cn

Syllabus of *Higher Mathematics for Engineers (1)*

COURSE CODE: B1A091061L
COURSE TITLE: Higher Mathematics for Engineers (1)
LECTURER: YA Li
HOURS: 90
CREDITS: 6

Course Description

This course is a first course in the calculus of one variable intended for engineering major. This course mainly concentrates on the functions of one variable, which includes topics of derivatives and integrals of functions and a variety of applications of differentiation and integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Contents and Arrangements

This course covers Chapter 1-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Functions and Models
2. Limits and Derivatives
3. Differential Rules
4. Application of Differentiation
5. Integrals

6. Applications of Integration
7. Techniques of Integration
8. Further Applications of Integration
9. Differential Equations
10. Parametric Equations and Polar Coordinates

Syllabus of *Introduction to China*

COURSE CODE: B1C251221L
COURSE TITLE: Introduction to China
LECTURER: SUN Yan
HOURS: 32
CREDITS: 2

Course Characteristics

This course is tailored for foreign students who learn their undergraduate majors in English-Medium, and it is a compulsory course categorized in general courses. General speaking, owing to limit experience and mislead of medium oversea the most of the undergraduate students have fragmental, superficial, not comprehensive and even sometimes wrong on China and Chinese society. This course will not only impart comprehensive and systematical knowledge into foreign students on Chinese geography, Custom, culture, history, Education, legal system and political system, but also introduce some hot topics to foreign students for example , reform and open to outside world policy and its achievements, religion and its policy, population and its policy, as well as foreign policy and the policies toward Hang Kong, Macao and Taiwan.

Course Target and Task

This course will fulfill the students following graduation tasks: 1. They will obtain an overall, systematical and positive understanding about China. 2. Affection will be cultivated and this course will lay a foundation to foster scholars who know China, treat China as a friend and support China. 3. This course will benefit their further study and life in China and provide them with necessary knowledge and information to understand Chinese society and communicate with Chinese. So it is very important aim for this course to provide some necessary, basic, accurate and important information to foreign students in order to understand China and the Chinese well.

Topics, Lectures and Hours Distribution

This course consists of twelve topics two practices. Twice practices will make students to experience and witness Chinese culture and Chinese society personally. Detail arrangements are as follows:

1. Basic Information and national condition, including the territory administrative division, climate etc.
2. Chinese traditional festivals and customs
3. Chinese History and Confucius
4. Reform and Open to Outside World and Its Achievements

5. Education , Religion and its Policy
6. Political System and State structure
7. Legal System
8. Population and its Policy
9. Foreign Policy and the Policies Toward HK, Macao and Taiwan visiting a Museum
10. Visiting Yuan Ming Park or Great Wall

Syllabus of *Chinese (1)*

COURSE CODE: B1C251151L
COURSE TITLE: Chinese (1)
COURSE CHINESE TITLE: 汉语（1）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course is prepared for overseas students who have never learnt Chinese or those who have a command of less than 100 new words. The course is based on the study of new words and grammar, and at the same time focuses on the cultivation of listening and speaking ability. Students need to complete primary communication tasks (including confirmation, introduction, time and direction, daily needs) which help students to acquire initially comprehension and expression ability and conduct basic conversation in Chinese in daily life and school life.

The course aims to help most students to be up to HSK1 level in listening, speaking, reading and writing aspects.

Course contents

The course contents and detail arrangement are as follows:

1. The study of Pinyin (Chinese phonetic alphabet)
2. Topics about: Name& nationality, Personal belongings, Family, Class, Birthday and Date, Work and rest, School, Room, Have a meal, Shopping, Handle affairs, Means of transportation etc.

Syllabus of *Introduction to Aeronautics and Astronautics (B)*

COURSE CODE: B2F050121L
COURSE TITLE: Introduction to Aeronautics and Astronautics（B）
RESPONSIBILITY PROFESSOR: YANG Chao, JIA Yuhong
SEMESTER: Fall/Spring
CREDITS: 2

HOURS: 26

Course Description

《The Introduction of Aeronautics and Astronautics》is a required course for the students of first year in the university. It is about basic knowledge, basic principles and development situation of aeronautics and astronautics technology. The learning of this course can stimulate the learning interest of students and improve the understanding for basic contents of aeronautics and astronautics technology.

Course Objective

The learning purpose of this course is to learn about the general development situation, basic concepts, basic knowledge of aeronautics and astronautics field, and learn about the position and function of learning specialty in aeronautics and astronautics technology.

1. Knowledge ability
2. Ability to explore problems and solve problems
3. Ability of leadership and guidance
4. Consciousness of morality and service
5. Enhance international view

Course Contents

1. General development situation of aeronautics and astronautics
2. Flight environment and flight principles
3. Energy power system of flight vehicle
4. Airborne equipments of flight vehicle
5. Flight vehicle structure

Syllabus of *University Computer Foundation*

COURSE CODE: B1B061011L
COURSE TITLE: University Computer Foundation (International College)
COURSE CHINESE TITLE: 大学计算机基础
RESPONSIBILITY PROFESSOR: CAO Qinghua
CREDITS: 2
HOURS: 44 (26 Hours in class +18Hours for experiments)

The Nature, Purpose, and Goals of this Subject

This course is a basic course for students majoring in computer science. The arrangement of the course uses the method of combining theory and practice, the key to help students master the basic skills of computer, practical operation and comprehensive application, and then improve the students' ability to analyze problems and solve problems.

The teaching of this course and the computer experiment, students should meet the basic requirements

including: the basic concepts of computer, computer basic knowledge and principle, network knowledge and multimedia application technology. The general objectives for this course can be divided into the following:

1. The development of computer, new technology and modern information technology.
2. Master the conversion between carry counting system and number system method, and method of data in the computer.
3. Master computer system components and working principle.
4. Comprehensive application of common office software.
5. Basic knowledge and application of computer network.
6. Understand the concept of information security.
7. Concept and application of multimedia.
8. In accordance with the requirements, Cooperative writing papers and submit.

Course Contents

1. Computer Basic Knowledge
2. Computer System
3. Office Software
4. Computer Network
5. Information Security And Morality
6. Multimedia Technology Foundation
7. Comprehensive

Syllabus of *Introduction to Mechanical Engineering*

Course Code: B3I072030
Course Title: Introduction to Mechanical Engineering
Credits/Hours: 2.0/34 (32 (Hours in class)+2(Hours for experiments))
Lecturer: ZONG Guanghua

Course Objects

This course is one of the general education curriculums designed for the freshmen majoring in Mechanical Engineering, which contains freshman seminar (16 units). However, this course should highlight its characteristic of aeronautics and astronautics, and try to avoid homogeneity from other general education courses being taught.

The purpose of the course is to show an overview to the subject of Mechanical Engineering, stimulate students' interests, and inspire students' thought of the issue about what should be learned as well as explore the best way to study. All the above can be done by classroom instruction and research study on special project. Concretely, the purpose can be described as following: Making students familiar with the construction of basic mechanical product, the process of mechanical design, machining, and assembling;

Building up a solid foundation and principle of Dynamic & Control for students; Introducing the concept of whole life cycle of product design and manufacturing; Broadening students' horizons to the new trend and development in product design and manufacturing. The teaching process should focus on the combination of theory and practice. The course will eventually help students acquire more knowledge of Mechanical Engineering, and encourage them to devote themselves to the aeronautics and astronautics industry with great interests.

Course Contents

1. Introduction
2. Mechanism, part and machine
3. Mechanical design
4. Specific design of mechanical structure
5. Overviewing of mechanical manufacturing
6. Materials of mechanical engineering, compatibility and tolerance.
7. Aircraft manufacturing technology
8. Robots
9. Electromechanical control and its test

Syllabus of *Engineering Graphics B*

COURSE CODE: E07B103I
COURSE TITLE: Engineering Graphics B
LECTURER: Wang Yunqiao
HOURS: 54+10
CREDITS: 4.0

COURSE DESCRIPTION

Engineering drawing is the important and necessary tool to communicate technical ideas for engineers and Engineering graphics is the requisite fundamental course for the engineering students. Traditional multiview projection theory and computer graphics are introduced for solving engineering problems graphically. The standards and conventions in 2D drawings and 3D models by computer aided design softwares. Engineering drawing can be read and interpreted accurately. The ability to draw and think in visible forms will be trained.

COURSE OBJECTIVE

Cultivate and develop the students' spatial analysis and spatial visualization abilities by using engineering drawings and models. Students learn to create a standard engineering drawing to represent a geometry solid or engineering features using hand tools or CAD and read and understand drawings. The

national and international standards about engineering drawing and modeling , as well as some common used mechanical constructions, thread, gear, key and assembly will be introduced.

CONTENTS AND ARRANGEMENTS

1. Introduction: Descriptive geometry and mechanical drawing
2. Fundamental for mechanical drawing
3. Dimension and Geometric Construction
4. Basic Orthographic Projection
5. Primitive Solids and Cutting
6. Simple Composite Solids
7. Intersection of solids
8. Introduction to Computer Drawing and Modeling
9. Pictorial drawing and third-angle projection
10. Fundamental methods for representation of mechanical parts
11. Dimensioning of complex part
12. Threads
13. Detail Drawing
14. Assembly Drawing

Syllabus of *Higher Mathematics for Engineers (2)*

COURSE NUMBER: B1A091071L
COURSE NAME: Higher Mathematics for Engineers (2)
LECTURER: PENG Gao
HOURS: 86
CREDITS: 5

Course Description

This course is a second course in the calculus of one variable intended for engineering major. It is designed to meet the needs of students who have completed Higher Mathematics for Engineers (1) and desire to extend their skills in this subject. This course mainly concentrates on the integral calculus. Topics include an overview of integration, basic techniques for integration, a variety of applications of integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important

applications of concepts

3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Course Contents

This course covers Chapter 6-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Applications of Integration
2. Techniques of Integration
3. Further Applications of Integration
4. Differential Equations
5. Parametric Equations and Polar Coordinates

Syllabus of *Advanced Algebra in engineering*

COURSE CODE: B1A091031L
COURSE NAME: Advanced Algebra in engineering
LECTURER : ZHAO Di ; LI Hongyi
HOURS: 64 hours lectures +16 hours drills
CREDITS: 5

COURSE DESCRIPTION

Linear Algebra is an undergraduate course. It has been introduced here as a handy tool for solving practical problems. Linear Algebra has many applications in other disciplines, such as statistics, economics, engineering, physics, biology, and business. Linear Algebra is ore useful now than at almost any time in the past. Due to the computer revolution, Linear Algebra has risen to a role of prominence in the mathematical curriculum.

COURSE OBJECTIVE

Students are asked to solve similar problems or explain the basic concepts. The study of Linear Algebra instills habits of thought that are essential for a proper understanding of many areas of pure and applied mathematics.

COURSE CONTENTS

1. Determinants
2. Matrices
3. Linear dependence of vectors
4. Linear equations
5. Similar standard form

6. Inner space and Quadratic form

Syllabus of *University Physics for Engineering I, II*

COURSE CODE: B1A19101BL，B1A19201BL
COURSE TITLE: University Physics for Engineering I, II
LECTURER:
HOURS: 64
CREDITS: 4

Course Characteristics

Physics is the subject of studying the basic structure of matters, the interactions between them, and the most fundamental and universal movements of the matters and their transformations. Physics is the basis of all natural sciences. In the 2l century, physics will still be in the leading position in the developments of science and technology.

Through College Physics teaching shall guides the students to acquire a comprehensive and systematic knowledge and understanding about the basic concepts, theories and methods of physics. In addition, through College Physics teaching shall as well enable the students to have preliminary ability of applying the knowledge.

The concrete requirements of these three levels are as follows:

1. Mastery: thoroughly understand the physical contents, master the applicable conditions, and be able to use skillfully. Generally required to be able to derive formulas.
2. Understanding: Generally not required to derive formulas but be able to analyze and calculate the relevant problems.
3. Acquaintance: know about the content. Be able to give qualitative explanation and do simple calculation. Generally not required to apply.

Course Content

1. Mechanics
   1) Particle kinematics
   2) Newton's law
   3) Work and energy
   4) Impulse and momentum
   5) Motion of rigid body
   6) Special theory of relativity

2. Electromagnetism
   1) Electrostatic field
   2) Constant magnetic field
   3) Electromagnetic induction
   4) Electromagnetic field

3. **Kinetic theory of gases and Thermodynamics**
   1) Kinetic theory of gases
   2) Thermodynamics
4. **Mechanical vibration**
5. **Wave and Wave Optics**
   1) Mechanical Wave
   2) Electromagnetic Wave
   3) Wave Optics
6. **Modern Physical Basis**

Syllabus of *Chinese (2)*

COURSE CODE: B1C251161L
COURSE TITLE: Chinese (2)
COURSE CHINESE TITLE: 汉语（2）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course aims to help overseas students who have already had a foundation of Chinese to proficiently use Chinese Pinyin and write commonly-used Chinese characters. Students are required to have a command of more than 600 common words and 60 grammar points, at the same time further improve their understanding and communicative abilities. It also helps students to lay a firm foundation to well prepare for Chinese study in second year. It requires students to use Chinese language knowledge and skills to solve basic problems in daily life and complete primary communicative tasks in the course, such as life schedule, asking for help, explanations, descriptions and comparisons. The course emphasizes the training of listening, speaking, reading and writing to improve comprehensive abilities. At the same time, it will teach students with study methods to strengthen their confidence in language learning and guide them to study by themselves.

The course aims to help most students to be up to HSK2 level in listening, speaking, reading and writing aspects.

Course contexts, tasks and study hours

The course contents and detail arrangement are as follows:

1. Daily activities
2. Weekends
3. Chinese Courses
4. Sports
5. Personal Skills
6. Direction & Distance
7. Accommodation
8. Hobbies
9. Health

10. Age, Height and Weight
11. Dress
12. Chinese study
13. Weather
14. Food
15. City
16. Event

Syllabus of *C Language Programming*

COURSE CODE: B1B021121L
COURSE NAME: C Language Programming
COURSE CHINESE NAME: C 语言程序设计
LECTURER: WANG Li-jing
HOURS: 48
CREDITS: 2.5

The Nature, Purpose and Task of the Course

1) C language is a computer language used widely at home and abroad, which has been widely applied in the development of system software and application software with its rich and flexible control and data structure, simple and efficient expressions, clear program structure, and good portability.
2) Purpose and mission is to guide students into a great potential curriculum design of computer programming, cultivate students' logical thinking ability, abstract ability and basic computer programming skills.
3) Through the study of this course, students master a high-level programming language, learn to use the C language to solve general application problems. Learn to read simple application written in a computer programming language, master the basic structured programming method and basic steps of using computers to solve practical problems, and lay a good foundation for further study of the other basic courses and professional courses. The C programming language is a very strong practical courses,which must be required through hands-on learning of knowledge, so special emphasis on combing lecture and hands-on is necessary, while make sure every student have adequate computer conditions.
4) Key skillsaccording with graduate training target in mining issues and problem-solving: training students to think independently, active discovery, analysis, design and problem solving, and have the basic research skills for engaging in aircraft design disciplines.

Course Content

1. Programming and C language
2. Algorithm-the soul of the program

3. The simplest programming -sequential programming
4. Selective structure programming
5. Cycle structure programming
6. Batch process data by using array
7. Block-based design by using function
8. Excelingat using pointer
9. Building the data type of the user
10. Input and output to the file

Syllabus of *Probability and Statistics A*

COURSE CODE: A09B204I
COURSE NAME: Probability and Statistics A
LECTURER: Mahboob Iqbal
HOURS: 48
CREDITS: 3

Course Description

This course provides an introduction to probability and statistics with engineering applications. Topics include: fundamentals of statistics; basic probability models; combinatorics; random variables; discrete and continuous probability distributions; statistical estimation and testing; confidence intervals; regression; and introduction to random processes.

Course Objective

Understand random outcomes and random information

1. Learn how handle statistical information
   1) statistical analysis
   2) model building
2. Understand probability theory
3. Learn random variables and distributions
4. Know-how of random processes

Contents and Arrangements

1. Introduction to Statistics
2. Descriptive Statistics
3. Elements of Probability
4. Random Variables
5. Special Probability Distributions
6. Distributions of Sampling Statistics

7. Statistical Estimation
8. Hypothesis Testing
9. Correlation and Regression
10. Random Processes

Syllabus of *Complex Analysis*

COURSE CODE：B1A05201B
COURSE TITLE: Complex Analysis
COURSE CHINESE TITLE：复变函数
LECTURER: CHEN Yulin
Credits: 2
Hours： 32

Course Type and Main Objectives

This course is a fundamental course in college of Engineering. It helps sophomores and juniors to further study mathematics after learning Mathematical Analysis. Studying this course, the students in engineering majors, such as aeronautics, mechanical engineering and civil engineering, can master and apply mathematical tools to prepare for the specialized courses. In this course, students are required to master the basic content of the textbooks, to complete exercises of each chapter and homework assignments independently, and to analyze specialized models by using the integrated knowledge of complex function.

This course supports the following graduation requirements:

A. Basic theory and knowledge of mathematics.

F. Basic methods of literature search and certain scientific research and practical work abilities.

Course Content

1. Introduction
2. Analytic functions
3. Complex functions integrals
4. Series
5. Residues exordium

Syllabus of *General Physics Experiment*

COURSE CODE：A19A203，A19A204
COURSE TITLE：General Physics Experiment
COURSE CHINESE TITLE：基础物理实验 B(1)(2)
LECTURER: LI Hua
Hours: 60

Credit： 3.5

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It is a beginning for students to learn systematic experimental method and technology.

The course of general physical experiment has various experimental ideas, methods and tools to provide comprehensive training for basic experimental technology. It is an important foundation for students to enhance scientific experimental ability and scientific accomplishment. It could not be replaced by other practical courses for students to train their religious scientific attitude, active consciousness of innovation, comprehensive ability of connecting theory and practice, adaptability of the development of science and technology, and so forth.

Students could get basic knowledge as follows: measuring method of fundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on) and error evaluation of measuring result.

Course Contents

1. Measurement of metal elastic modulus
2. Measuring moment of inertia of a rigid body
3. A series of experiments on the air track
4. Digital measurement experiment
5. Thermal experiment
6. The application of the oscilloscope
7. Resistance measurement
8. Potentiometer and its applications
9. Thin lens and the focal length of a single spherical mirror measurement
10. Spectrometer adjustment and its application
11. Light interference experiment I（Partial wave surface method）
12. Light interference experiment II（Sub-amplitude method）

Syllabus of *Theoretical Mechanics A*

Course Code： B3I05201A
Course Chinese Name: 理论力学 A
Course English Name： Theoretical Mechanics A
Semester: Autumn & Spring Semester

Lecturer： Wang Qi, Guo Yi Yuan
Credit： 5.5/90

Nature, Target and Task of the Course

Theoretical Mechanics is not only the foundation of all mechanical courses, but also a technical basic course that focuses on statics analysis, kinematics analysis and dynamics analysis of engineering objects. It is widely used in many engineering fields. The task of Theoretical Mechanics is: to let the students grasp the basic rules and research methods of mechanical motions (including equilibrium) of a particle, a system of particles, a rigid body, and a system of rigid bodies, thus to form a necessary background for relevant follow-up courses, for learning and mastering new sciences and technology in the future; to let the students preliminarily grasp how to analyze and solve some simple engineering problems with the basic principles and methods of Theoretical Mechanics ; to cultivate the students' scientific ways of thinking, the right world view, and the related ability according to the characteristics of the course.

Course Contents

1. Introduction
2. Equilibrium of a Particle
3. Equilibrium of a Rigid Body
4. Equilibrium of Rigid Body Systems and Structures
5. Equilibrium of a Particle System
6. Dynamics of a Particle
7. Dynamics of a Particle System
8. Dynamics of a Rigid Body (part one)
9. Method of Dynamic-static
10. Lagrange Equations
11. Dynamics of a Rigid Body (part two)
12. Fundament of Mechanical Vibration

Syllabus of *Mechanical Technology Practice A*

Course No.: G32A2010
Course Title: Mechanical Technology Practice A
Credit/Class Hour: 3.5/140
Lecturer: Zhang Xinghua

Course Objects

Mechanical Technology Practice is an important basic technical course, which takes mechanical manufacturing as the carrier in the undergraduate college in order to cultivate students' ability of engineering practice.

1. To understand the whole technical process of production mode and machines in modern

manufacturing industry from the materials, parts, to even the machines, get familiar with the main forming methods of engineering materials and the main machining methods, possess with a preliminary skill of independent operation, and lay a good foundation for the follow-up courses, graduation design, professional course design, comprehensive experiments, and extra-curricular scientific and technological practice.

2. To master the process knowledge and the knowledge of modern management in a certain extent, cultivate students' ability of engineering practice and team spirit, and improve and strengthen students' innovation consciousness and innovation ability.
3. To make the students understand and comprehend the common technology in mechanical manufacturing system through training (such as transmission technology, detection and display technology, and information synthesis and control technology, etc.), and provide a sensible understanding to the follow-up courses.
4. To carry out the ideological education, train and exercise the attitude to labor, and quality and economic concepts, strengthen students to observe labor discipline and comply with the safety rules in consciousness, and improve the overall quality of students.

Course Content

1. Practice of Heat Treatment for Surface Protection
2. Casting Practice
3. Forging and Pressing Practice
4. Welding Practice
5. Practice as the Lathe Worker
6. Active as a Miller
7. Practice as the Grinder
8. Practice as the Bench Worker
9. Practice of Wire Cut Electrical Discharge Machining
10. Laser Practice
11. Practice of Numerical Control Machining

Syllabus of *Mechanics of Materials (A)*

Course Code： B3I052030
Chinese Name： 材料力学 A
English Name： Mechanics of Materials(A)
Term： Spring-Summer
Lecturer : Hua Liu
Credits/Hours： 5/64+16

Course type and main objectives

This course focuses on the strains, stresses, strengths, rigidities, stabilities, and failure criteria of materials under loads and offers the necessary theory for designing engineering structures from a material point of view. It is a fundamentalcoursein college of Engineering and taught in almost allcurricula related to mechanics, such as aeronautics, mechanical engineering and civil engineering. The prerequisite courses are Advanced Mathematics and Theoretical Mechanics. With this course of study, students are required to analyze the strength, rigidity and stability problems for a given member, have the ability to establish mechanical models for a practical problem and analyze them in a simple and logical manner.

Course Content

1. Introduction
2. Stress under axial loading, mechanical properties of materials
3. Deformations under Axial Loading
4. Torsion
5. Internal forces in bending
6. Bending stresses
7. Deflection of beams
8. Analysis of stress and strain
9. Strength of complex state of stresses
10. Combined loading
11. Buckling of columns
12. Further studies of bending problems
13. Strain-energy method
14. Analysis of statically indeterminate problems
15. Dynamic loading
16. Fatigue
17. Experimental stress analysis
18. Review

Syllabus of *Fundamental of Mechanical Design A(1)*

Course Code: B3I072030
Course Title: Fundamental of Mechanical Design A(1)
Credits/Hours:2.5/54(40(Hours in class)+4(Hours for experiments)+10 (Hours for practices))
Responsible Professor: GUO Weidong

Course Objects

Theory of Machines and Mechanisms is a basic technical subject that aims to cultivate the students' thinkingskills in engineering and the ability of the students to innovatively design mechanical systems. This course is a fundamental course in machinery engineering.

The general objectives for this subject can be divided into the following:

1. The comprehension of the latest development in modern machinery and mechanisms, as well as the

generic process of the conceptual designs of mechanical systems with the establishment of a correct and justifieddesign ideology and historical perspective of mechanical systems.

2. Master the basic properties, design principles, and design methods for common mechanisms; emphasizes on the cultivation of engineering and innovative thinking, and obtain of the ability to design basic mechanical systems.
3. Master the ability to proof and analyze structures or intermediate complex mechanical system's performances with the assistance of advanced tools such as ADAMS.
4. Master the ability to gain relative technical information such as applicatory standards, specifications, and manuals, etc.
5. Master the experimental methods for performance tests and mechanical mechanismmotion schemes; gain basic training in laboratory skills.
6. Master the methods and theories in proofs in design schemes, and the establishment, analysis, and evaluation of mechanical system models; develop innovative design skills for students when analyzing a solving practical engineering problems.

Contents

1. Introduction
2. The Formation and the Structure of Mechanisms
3. Planar Linkages
4. Cam Mechanisms
5. Gear Mechanisms
6. Gear Trains
7. Intermittent Mechanisms
8. Design of mechanical system motion schemes
9. Kinematics basics in mechanical systems

Syllabus of *Science of Engineering Material*

Course Code: B3I072310
Course Title: Science of Engineering Material
Credits/Hours: 2/32(30(Hours in class)+2(Hours for experiments))
Lecturer: ZHANG Yanhua

Course Objects

This course is a fundamental principles of materials science and engineering. The course will address the fundamentals of structure-property-processing relationships in engineering materials and relate these fundamentals to the performance of the materials. Course topics will provide students the knowledge required to produce designs of mechanical components with appropriate material and process specifications. The general objectives for this subject are as follows:

1. To provide the student with an advanced understanding of the materials used in mechanical engineering.
2. Understand the properties of engineering materials, in particular the relation of the microstructure and

mechanical properties

3. Students will be able to identify and explain the features in materials microstructure which affect various materials properties.
4. To provide the student a basic understanding of the main classes of engineering materials and applications in various mechanical components or structures.

Contents

1. Introduction
2. Structure of Materials
3. Properties of engineering materials
4. Solidification and Phase Diagrams
5. Deformation of metallic materials.
6. Heat Treatment of steel
7. Ferrous Alloys
8. Non-Ferrous Alloys
9. Polymer and Ceramic

Syllabus of *Fundamentals of Thermal Engineering*

Course Code: B3I072110
Course Title: Fundamentals of Thermal Engineering
Credits/Hours: 2/32(30(Hours in class)+2(Hours for experiments))
Lecturer: ZHANG Yanhua

Course Objects

Mechanical engineering systems involve the transfer, transport, and conversion of energy. Thermal engineering are usually studied the thermodynamics and heat transfer. This course covers the basic principles of thermodynamics and heat transfer in engineering. It is our hope that the course helps students develop the necessary skills to bridge the gap between knowledge and the confidence to properly apply knowledge. The general objectives for this subject are as follows:

1) Leads students toward a clear understanding and firm grasp of the thermodynamics and heat transfer in mechanical engineering.
2) Students will understand the property equations and thermodynamic properties of special systems
3) Students will be able to determine the direction of the process from the first and second law of thermodynamics.
4) Students will be able to analyses the heat transfer .

Course Contents

1. Introduction
2. Basic concepts of Thermodynamics
3. The first law of thermodynamics
4. The Second and Third Laws of Thermodynamics
5. Thermodynamic Property Relations
6. Vapor and Combined
7. Power Cycles
8. Refrigeration Cycles
9. Heat Transfer and Heat Exchangers

Syllabus of *Teaching Program for Electronic technology Training*

Course Code： G32A2040
Course Title： Electronic technology training
Credit/Hours： 2/80
Lecturer： Zhang Wuqian、Cui Jian

Course Objects

The course is a public compulsory course for engineering majors of undergraduate students. Through the course, students have a more comprehensive understanding of technologies on electronic circuit assembly, design and debugging process.

Students would learn skills on characteristics of electronic components, how to identify and detect components. They would getuseful skills on circuit soldering and necessary knowledge on instruments operating. At the end of the course, students should gain the abilities on circuit analysis, instruments operation and circuit board (PCB) designing.

Contents

1. Electronic assembly technology training
2. Electronic debugging technology training
3. soldering training
4. electronic component detecting
5. circuit assembly
6. circuit debugging training
7. report writing
8. 80 hours totally, final examination in the last

Syllabus of *Fundamentals of Electro-mechanical Control Engineering*

Course Code: B3I073410
Course Title: Fundamentals of Electro-mechanical Control Engineering
Credits/Hours: 2/46(40(Hours in class)+6(Hours for experiments))
Lecturer: LIU Qiang

Course Objects

The Fundamentals of Electro-mechanical Control Engineering is a basic technical subject that aims to cultivate the students' thinking skills in engineering and the ability of the students to innovatively design electro-mechanical systems. This course is a fundamental course in electro-mechanical engineering.

The general objectives for this subject can be divided into the following:

1. The comprehension of the latest development in modern machinery and mechanisms, as well as the generic process of the conceptual designs of mechanical systems with the establishment of a correct and justified design ideology and historical perspective of mechanical systems.
2. Master the basic properties, design principles, and design methods for common mechanisms; emphasizes on the cultivation of engineering and innovative thinking, and obtain of the ability to design basic mechanical systems.
3. Master the ability to proof and analyze structures or intermediate complex mechanical system's performances with the assistance of advanced tools such as ADAMS.
4. Master the ability to gain relative technical information such as applicatory standards, specifications, and manuals, etc.
5. Master the experimental methods for performance tests and mechanical mechanism motion schemes; gain basic training in laboratory skills.

Contents

1. Introduction to Control Systems
2. Mathematical Models of Systems
3. Time Domain Analysis
4. The Root Locus Method
5. Frequency Response of Dynamic Systems
6. The compensation of Control Systems

Syllabus of *Fundamentals of Manufacturing Engineering (1)*

Course Code: B3I072320
Course Title: Fundamentals of Manufacturing Engineering (1)
Credits/Hours: 2/32(30(Hours in class) + 2 (Hours for experiments))
Lecturer: ZHANG Yanhua

Course Objects

This course provides a fundamental principles of manufacturing processes include casting, forging, rolling, extrusion, welding, sintering and plastics forming processes. Course topics will provide students the knowledge required to produce mechanical components with appropriate process specifications. The general objectives for this subject are as follows:

1. To provide the student with an advanced understanding of the manufacturing processes used in mechanical engineering.
2. Students will understand the role of materials in manufacturing processes and the effect of processes on mechanical properties
3. Students will be able to select appropriate manufacturing processes for metals, alloys, polymers, and ceramics
4. Students will learn to select manufacturing processes according material, cost, quality, and competitiveness

Contents

1. Introduction
2. Casting processes
3. Forming processes
4. Welding processes
5. Powder Metallurgy
6. Rapid Prototyping
7. Surface Treatment
8. Processing of polymer, ceramic and composite
9. Inspection

Syllabus of *Fluid Transmission*

Course Code: 07z8703
Course Title: Fluid Transmission
Credits/Hours:2.5/38(32(Hours in class)+6(Hours for experiments))
Lecturer: ZHANG Jianbin

Course Objects

Fluid transmission course is a specialty basic compulsorycourse for mechanical engineering, and has the engineering application background strongly. Its aim is to make students understand operating principle of hydraulic transmission, the characteristics and the application in machine tools and other mechanical equipment clearly, and enhance their ability of the engineering problem analysis and the solution. This course is a fundamental course in machinery engineering.The general objectives for this subject can be divided into the following:

1)Establishthe correct physical concept of fluid force balance and movement rules, and rasp the basic laws of fluid statics and dynamics, as well as solve problems flexibly by basic theory.
2) Master the basic concepts and basic operating principle of hydraulic transmission.
3) Master the operating principle, performance, structure and application of the main hydraulic components.
4) Master the characteristics and application of the basic circuit.
5)Master the analysis method for machine tool system and possess the hydraulic circuit design ability.

Contents

1. Introduction
2. Hydraulic Oil and Fundamental Hydraulic Fluid Mechanics
3. Hydraulic Pumps and Hydraulic Motors
4. Hydraulic Cylinders
5. Hydraulic Control Valves
6. Auxiliary Components
7. Basic Hydraulic Circuits
8. Typical Hydraulic Transmission Systems

Syllabus of *Mechanical &Electrical Transmission Control*

Course Code：B3I073420
Course Title： Mechanical & Electrical Transmission Control
Credits/Hours： 2/38(32(Hours in class)+6(Hour for experiments))
Lecturer： Qi Bojin

Course Objects

Mechanical & Electrical Transmission Control,a basic course ofmain technology of *Mechanical Engineering* major which is designated by the *Teaching and Guidance Committee of Mechanical Engineering* of National Colleges and Universities, is a compulsory, important, professional, basic course of *Mechanical Engineering*and also among the professional knowledge to master by mechatronics talents. This course the professional basic course of *Mechanical Engineering* major of Beihang University, containing the directionof design, manufacturing and material, etc.

The instructional objectives can be specifically divided into the following 6 points:

1. Understand the latest progress in the development of modern mechanical and electrical drive systems, as well as the general process of mechanical and electrical system design;establish the idea of design mechanical and electrical drive system.
2. Master the basic principles, structure, mechanical properties, features, performance and application of common motor. Emphasize the cultivation of engineering thinking and creative thinking, and have the capability of design basic mechanical and electrical drive system.
3. Comprehend common open loop and closed loop control system especially the working principle, characteristic, performance and application of electromechanical drive servo system
4. Have the ability to obtain and use standards, specifications, manuals, books and other relevant technical information.
5. Master the experimental method of design and test the mechanical and electrical drive system; train the basic experiment skills.
6. Master the theory and method of design and analysis the relay contactor control system; cultivate the innovation ability of analysis and solving engineering practice problem.

Contents

The mechanical and electrical drive system is the object to study in this course, mainly including the composition and structure of the motor, analysis and design of common motor and basic dynamics of mechanical systems, etc.

1. Introduction
2. The structure and the principle of transformer
3. The dynamic basis of mechanical and electrical drive system
4. direct-current motor (DC motor)
5. Three-phase alternating-current motor (Three phase AC motor)
6. Control motor
7. The motor selection in mechanical and electrical transmission system
8. Common relay-contactorcontrol system
9. Stepper motor

Syllabus of *Fundamentals of Robotics*

Course Code: B3J073510
Course Title: Fundamentals of Robotics
Credits/Hours: 3/48(40 hours in class+8 hours for practice)

Lecturer: Ding Xilun

Course Objects

This course is a specialized course for the junior students whose major is in mechanical engineering related. Fundamentals of Robot Techniques, which covers mechanical design, automatic control, electronic technique, and so on. It is a technical foundation course for undergraduate students to know the history, basic theory and techniques of robots, and it is also an introductory course for the student whose mayor is mechanical engineering and automation to learn basic knowledge of robot technology. This course focuses on the development history, system composition and kinematics of robot, meanwhile includes rudimentary Knowledge on dynamics and control technology.

The key technology of a typical robot or mechatronic system, which covers the contents of mechanical design, automatic control, electronic technology, and so on. Through this course the students participated in the class can understand the status of research and development, basic principles, key technologies and main research fields of robotic technology. And the student can also master the preliminary methods of robot design and control, and typical applications of robots. The course can promote curiosity of students on mechatronics and automation.

The main objectives of this course:

1. Understand the status of robotic research and development;
2. Master the basic knowledge on robot structure design, the students can get the ability to design a simple robot;
3. Familiar with typical mechanisms and systems of robots;
4. Master kinematics and inverse kinematics of robots, the students can possess the basic ability of robotic analysis;
5. Understand the fundamentals of robotic dynamics.
6. Understand the basic concepts and types of robot control.

Contents

1. Introduction
2. The composition of the robot
3. Robotic Mechanisms
4. Mathematical Description of Robot Pose and Coordinate Transformation
5. Robotic Kinematics
6. Reverse Solution of Robot kinematics
7. Robotic Dynamics
8. Robot Control
9. The types of robot control mode; The common control methods for robot control.

Syllabus of *Comprehensive Practice of Mechanical Design A*

Course Code: E07D3090
Course Title: Comprehensive Practice of Mechanical Design A
Credits/Hours: 3/120
Lecturer: BIAN Yushu

Course Objects

Nature: Comprehensive Practice of Mechanical Design A is a basic specialty course that aims to extend students' vision, cultivate skills of machine design, training abilities to solve practical issues. This course is a subsequent course of machine design.

Purpose: The main goal is to cultivate students' engineering experiences, design skill and innovation ability used to research and solve various design problems about all-purpose machines, typical mechanisms and parts, using theories and methods of machine design. The general objectives for this subject can be presented as follows:

1. Understanding the latest development of modern machinery, mastering general process of conceptual design of machinery, establishing correct philosophy of machine design.
2. Mastering modern design methods integrating mechanical structure, mechanical kinematics and dynamics.
3. Possessing abilities to analyze, design and prove mechanical system using several CAD tools (like: ADAMS, Pro/E).
4. Mastering basic features, design principles and analysis methods of common mechanisms and typical mechanical parts, learning to employ machine design standards and manuals to conduct in-deep analysis and design, possessing innovation design ability to analyze and solve problems.

Contents

1. Introduction
2. Training task analysis
3. Mechanism design
4. Determination of motor type
5. Design of important transmission parts
6. Design of shaft system
7. Design of reduction case and accessories
8. Drawing of reducer
9. Design of typical parts
10. Calculation directions
11. Test and defense

Syllabus of *Fundamental of Measurement*

Course Code: B3I073430
Course Title (English): Fundamental of Measurement
Credits/Hours: 2/34(28(Hours in class) + 6(Hours for experiments))
Lecturer: ZHOU Zhenggan

Course Objects

This course provides the knowledge of mechanical measurement and is one of the technical foundation courses for the discipline of mechanical engineering and automation. It not only introduces the basic theories of measurement technology but also approaches the topics of the measurement methods of the common physical quantities.

The general objectives for this subject can be divided into the following:

1. Know the basic principle and measurement technologies of nonelectric physical quantities. Know the principle of sensors in common use and their interface; Know basic characteristics of measurement equipment; Know signal description and its processing method.
2. Master the method to choose the appropriate instruments to build a measurement system or equipment with the purpose of measurement. Preliminary know the basic knowledge and technology needed for dynamic measurement. Master the measurement methods for displacement, vibration, temperature, force, pressure and noise. Master the basic knowledge of computer-aided measurement system and virtual instrument; Know the renewed knowledge and growing trend of measurement technology to lay a foundation for further studying and solving engineering problems of measurement.

Contents

1. Introduction
2. Measurement Error and Static Measurement Data Processing Signal Description and Its Processing Method Basic Characteristics of Measurement Equipment Principle of Sensors in Common Use and Their Interface
3. Typical Signal Adjustor
4. Computer Aided Measurement

Syllabus of *Comprehensive Practice of Mechanical Design A*

Course Code: E07D3090
Course Title: Comprehensive Practice of Mechanical Design A
Credits/Hours: 3/120
Lecturer: BIAN Yushu

Course Objectives

The main goal is to cultivate students' engineering experiences, design skill and innovation ability

used to research and solve various design problems about all-purpose machines, typical mechanisms and parts, using theories and methods of machine design. The general objectives for this subject can be presented as follows:

1. Understanding the latest development of modern machinery, mastering general process of conceptual design of machinery, establishing correct philosophy of machine design.
2. Mastering modern design methods integrating mechanical structure, mechanical kinematics and dynamics.
3. Possessing abilities to analyze, design and prove mechanical system using several CAD tools (like: ADAMS, Pro/E).
4. Mastering basic features, design principles and analysis methods of common mechanisms and typical mechanical parts, learning to employ machine design standards and manuals to conduct in-deep analysis and design, possessing innovation design ability to analyze and solve problems.

Contents

1. Introduction
2. Training task analysis
3. Mechanism design
4. Determination of motor type
5. Design of closed-type reducer
6. Design of important transmission parts
7. Design of shaft system
8. Design of reduction case and accessories
9. Drawing of reducer
10. Design of typical parts
11. Calculation directions
12. Test and defense

Syllabus of *Fundamental of Measurement*

Course Code: B3I073430
Course Title: Fundamental of Measurement
Credits/Hours: 2/34(28(Hours in class)+ 6(Hours for experiments))
Lecturer: ZHOU Zhenggan

Course Objectives

This course provides the knowledge of mechanical measurement and is one of the technical foundation courses for the discipline of mechanical engineering and automation. It not only introduces the basic theories of measurement technology but also approaches the topics of the measurement methods of the common physical quantities. The general objectives for this subject can be divided into the following:

1. Know the basic principle and measurement technologies of nonelectric physical quantities. Know the

principle of sensors in common use and their interface; Know basic characteristics of measurement equipment; Know signal description and its processing method.

2. Master the method to choose the appropriate instruments to build a measurement system or equipment with the purpose of measurement. Preliminary know the basic knowledge and technology needed for dynamic measurement. Master the measurement methods for displacement, vibration, temperature, force, pressure and noise. Master the basic knowledge of computer-aided measurement system and virtual instrument; Know the renewed knowledge and growing trend of measurement technology to lay a foundation for further studying and solving engineering problems of measurement.

Contents

1. Introduction
2. Measurement Error and Static Measurement Data Processing
3. Signal Description and Its Processing Method
4. Basic Characteristics of Measurement Equipment
5. Principle of Sensors in Common Use and Their Interface
6. Typical Signal Adjustor
7. Computer Aided Measurement

Syllabus of *Design and Practice of Mechatronic System*

Course Code: E07B3150
Course Title: Design and Practice of Mechatronic System
Credits/Hours: 2/34(14(Hours in class)+14(Hours for experiments)+6(Hours for discussion))
Lecturer: Tianmiao Wang,Diansheng Chen,Rong Liu, Team

Course Objectives

Through engineering practice teaching, students are expected to learn how to comprehensively use the theory of mechatronic system and electrical control to solve engineering problems in the design of mechatronic system, and preliminarily have thecapability of application and development of mechatronic system. This course also aims to exercise the students' spirit of teamwork, develop the students'consciousness of scientific and technological innovation.

The general objectives for this subject can be divided into the following:

1. The comprehension of the latest development in modern mechatronics, as well as the generic process of the conceptual designs of mechatronics systems with the establishment of a correct and justifieddesign ideology of mechatronic systems.
2. Master the basic properties, principles, and design and application methods for common mechatronic systems; and obtain of the ability to design basic mechatronic systems.
3. Master the ability to establish model, prove and analyze mechatronic control system's performances with the assistance of advanced tools such as MATLAB.
4. Master the ability to gain relative technical information such as applicatory standards, specifications, and manuals, etc.

5. Through the practical projects, emphasize the manipulative ability and teamwork ability; master the experimental methods for mechatronic system; gain basic training in laboratory skills.
6. With the elicitation, interaction and exploration methods of teaching, emphasizes on the cultivation of engineering and innovative thinking, as well as communication ability.

Contents

The research object of this course is mechatronic system. Students will studythe composition, the design method and the engineering development technology ofthe mechatronic system.

1. Introduction
2. The overall design of mechatronic system
3. The design technology of sensor detection system
4. The design technology of servo driving system
5. Methods of design and development for microcomputer control system
6. Modeling, analysis and simulation for mechatronic control system
7. The numerical control interpolation algorithm and the numerical control programming

Syllabus of *Advanced Machining Technology*

Course Code: B3J073210
Course Title: Advanced Machining Technology
Credits/Hours: 2/34(32(Hours in class)+2(Hours for experiments))
Lecturer: CAI Jun

Course Objectives

Advanced Machining Technology is a manufacturing specialty courses that aims to culture the students' thinking and innovative ability in engineering. This course is a professional direction undergraduate course for those who majored in mechanical manufacturing and automation, but also can be used as selective course for mechanical engineering and automation major.The general objectives for this subject can presented as follows:

1. The comprehension of the latest development of modern processing technology, to establish a correct history view of mechanical machining and innovative thinking;
2. Master the common basic principles of advanced processing technology, equipment, structure, key technology, process characteristics, the main engineering applications expertise, focus on training engineering thinking;
3. Having the ability to select the appropriate processing method for the actual engineering needs so as to process complex parts;
4. Master the ability to gain relevant technical information such as applicatory standards, specifications, and manuals, etc.
5. Master the experimental methods for CNC machining; gain basic training in laboratory skills.
6. Master the main trends of advanced processing technology and the latest developments, able to analyze

and solve problems machining capacity for innovation.

Contents

1. Introduction
2. Advanced Cutting Technology
3. Grinding and Finishing Processing Technology
4. Electric Machining
5. High Energy Beam Machining
6. Microfabrication technology
7. Other advanced processing technology

Syllabus of *Theory of Mechanical Design*

Course Code:B3J073110
Course Title:Theory of Mechanical Design
Credits/Hours:2.5/40
Lecturer:ZHANG Yidu

Course Objectives

The Theory of Mechanical Design is a senior student level course about the theory of mechanical design for domestic and overseas students. One of the primary objectives of the course is to make students understand that a machine usually is a complicated system and a mechanical design process is different from the design process of specific machine elements such as gears, bearings, bolts, belts and chains, etc., in which systematic concept must be applied. The subjectobjectives can be described in brief as following:

1. Possessing the systematic design concept in mechanical design process.
2. Understanding the concept and masteringthe methods of Functional Principle Design for mechanical systems or products.
3. Understanding the concept and mastering the methods of Practical Design for mechanical systems or products.
4. Understanding the concept and mastering the methods of Commercial Design for mechanical systems or products.

Contents

1. Introduction
2. Functional Principle Design
3. Practical Design
4. Commercial Design

Computer Control System

Course Title：Computer Control System
Credit：32
Lecturer：Wenlei Xiao

Course Object

Study and understand the basic theories of computer control system, including Z transform, impulse transfer function, analysis of system characteristics, design methods of a computer control system, etc. Develop and improve the student's understandability of the computer control system technology. Students are thereby able to use the theories and technologies of computer control system to deal with real control problems.

Content

1. Introduction of the computer control system
2. Signal characteristics of the computer control system
3. Z Transform
4. Mathematical description & impulse transfer functions
5. Analysis of system properties
6. Discrete design method of continuous domains
7. Exercises

Syllabus of *Computer Aided Manufacturing*

Course Code: B3J073420
Course Title: Computer Aided Manufacturing
Credits/Hours: 3.0/46(46(Hours in class)+6(Hours for experiments)
Lecturer: ZHENG Lianyu

Course Objectives

The aim of this course is to comprehensively introduce the concepts, principles, methods and tools of computer aided design, manufacturing techniques in manufacturing engineering, and to train the skills of how to design, analyze and manufacturing a component or product using the prevalent CAD/CAM tools and CNC machines or equipment. The general objectives for this subject can be divided into the following:

1. The comprehension of the latest development in computer aided manufacturing engineering and digital manufacturing, as well as the generic process of product realization and related computer aided techniques, and the establishment of correct ideology and perspective of computer aided manufacturing in terms of information flow, model based and Lifecycle system engineering.
2. Master the basic properties, design principles, and design methods for computer aided manufacturing

engineering; emphasizes on the cultivation of engineering and innovative thinking, and obtain of the ability to design and implement computer aided manufacturing tools and systems,

3. Master the ability to model, analyze, process planning, program, machine and inspect intermediate complex component with the assistance of dominate system such as Pro/E UG or CATIA.
4. Master the ability to gain relative technical information such as applicatory standards, specifications, and manuals, etc.
5. Master the experimental methods for computer aided manufacturing engineering; gain basic training in laboratory skills.
6. Master the methods and theories in proofs in design schemes, and the establishment, analysis, and evaluation of digital manufacturing systems or tools; develop innovative design skills for students when analyzing a practical engineering problem.

Contents

1. Introduction
2. Environments of Computer Aided Manufacturing
3. Product Modeling
4. Product Design
5. CNC Programming and Machining
6. Computer Aided Process Planning
7. Computer Aided Quality Control
8. Automatic Manufacturing Systems
9. CAD/CAM Integration and Product Lifecycle Management

Syllabus of *Capstone Course for Mechanical manufacturing and automation Major*

Course Code:
Course Title: Capstone Course for Mechanical manufacturing and automation Major
Credits/Hours: 3/80
Lecturer: WANG Yanzhong

Course Objectives

This subject is a required course for Mechanical manufacturing and automation profession. The aim is to cultivate the students' skill of process planning, technological equipment design, CNC machine programming and operating. This will lay the foundation for training high level machinery talents. The general objectives for this subject can be divided into the following:

1. Cultivate students' skill of process planning,technological equipment design;
2. Cultivate students' skill of CNC machine programming and operating;

3. Cultivate students' skill of solving engineering problems and Team collaboration.

Contents

1. Analysis of typical parts
2. Blank drawing design
3. Component technology analysis
4. Develop process route
5. Formulate process card
6. Special fixture design based on modularity
7. The NCprograming of special fixture processing unit
8. The NC machining of special fixture unit
9. The assembling of the special fixture unit
10. Evaluating of the special fixture

Bachelor Program of International Economics and Trade

（in English）

“国际经济与贸易专业”本科培养方案（英文授课）

(This document is the text compression version of the same major taught in Chinese and only for international students)

School of Economics and Management & International School

Beihang University, Beijing, China

北京航空航天大学经济管理学院 & 国际学院

September, 2015

Bachelor Program of International Economics and Trade

国际经济与贸易专业本科培养方案（全英文授课）

一、 学院简介

I. School Introduction

北京航空航天大学经济管理学院：始于 1956 年成立的航空工程经济系，是我国理工科大学中最早成立的管理类院系之一。1986 年成立管理学院，1999 年更名为经济管理学院。

School of Economics & Management at Beihang University (BUAA), originally established in 1956 as the department of Aeronautic Engineering Economics, is one of the earliest Management Schools among science and engineering oriented universities in China. In 1986, the department of Aeronautic Engineering Economics was updated into the School of Management and in 1999, it was renamed as School of Economics &Management.

学院设有 9 个系，4 个省部级重点实验室，4 个校级研究中心，12 个院属研究中心，5 个院属实验室。学院有 6 个博士学位授权点，1 个博士后流动站，11 个硕士学位授权点，6 个专业硕士学位授权点，以及 10 个本科专业。此外，还与海外著名大学合作培养国际 MBA、市场营销、和商学硕士研究生。

Now Beihang SEM consists of 9 departments,4 provincial level research hubs, 16 research centers (4 are sponsored by the university and 12 are sponsored by the school), and 5 laboratories. The school offers 6 PhD programs, 1 post-doctoral mobile research station , 11 academic master’s program, 6 professional master’s program, and 10 undergraduate programs. In addition to that, the school is also in cooperation with prestigious international universities to cultivate Master’s Degree Candidates on MBA marketing, and business science.

学院有教职工 107 人，89%的教师具有博士学位，大多数有国外留学、进修和国际合作研究的经历。学院现有在校学生 3018 人。

The school has 107 full time faculty members, 89% of them hold PhD degrees and many of them have studying, teaching or collaborative research experiences abroad.

学院位于北航新主楼 A 座，总面积 12000 平方米。其中多媒体教室、案例教室、案例讨论室、实验中心等教学面积 4500 平方米；图书资料中心 350 平方米，拥有藏书 26000 余册。学院在学校图书馆之外，独立订阅顶级外文学术期刊 50 余种，中文学术期刊 130 余种。

The school is located at the Tower A, New Main Building, Beihang University. It has a floor space of 12,000 square meters. The total area of multimedia room, case study room, case discussion room, and laboratory center is 4,500 square meters. The school library has a floor space of 350 square meters and a collection of 26000 volumes. Faculty and students are able to get access to more than 50 the top international academic journals and 130chinese academic journals in addition to the collection of the university library.

二、 培养目标

II. Educational Objectives

本专业培养掌握国际经济与贸易基本原理、国际经济和贸易的基本理论、知识与技能，了解当代国际和中国经济贸易发展现状，熟悉现行的国际贸易法规和规则，具有解决国际贸易实际问题能力。培养全面了解中国商业文化与商业规则，懂得中国和国际商务法律、法规，了解中外公司运作的一般规律，熟练掌握国际商务领域有关商务管理、市场调研、商业信息合理运用、人力资源管理 等方面实际应用技巧，具有一定创新能力的国际商务应用型、复合型人才。

The purpose of this program is to train high-level application-oriented professionals, who can grasp the fundamental theories, knowledge and skills in global economics and international trade; who should be quick in the awareness of the current economic development both at home and abroad; who can comprehend and apply into practice the current accepted standards, rules, regulations and laws in international trade and who can solve practical problems in this field. This program is to cultivate innovative, practical and all-round professionals who are familiar with Chinese and international commercial culture and rules, understand the primary principles of operation in both Chinese and international business, and acquire the knowledge of business management, market investigation, commercial information utilization and human resources management in the field of international business.

三、 毕业要求

III. Degree Requirements

来华留学生应具有一定的基础汉语水平，了解中国法律法规、传统文化和风俗习惯等，热爱母校，亲华、知华、优华。

Foreign students should have some basic level of Chinese language, understanding Chinese laws and regulations, traditional culture and customs, etc., and loving alma mater, knowing China, and loving China.

专业方面要求学生掌握国际贸易相关理论知识和一定的实践技能，具备从事国际商务活动必备的基础理论、专业知识、职业道德和职业技能，能从事对中国的国际贸易的相关工作，包括从事国际市场分析与开发、进出口交易磋商、进出口交易促进、进出口合同履行、国际商务谈判、国际贸易洽谈、 国际经济合作等工作。

Students of this program must have a mastery of theories and practical skills on the international trade, equip themselves with necessary knowledge for the international trade activities including basic theories, professional know-how, work ethics and professional skills, and are capable of being engaged in relative works on Chinese international trade, including analysis and development of the international market, negotiation and promotion of import and export, implementation of import and export contracts, international business negotiation and correspondence, and international economic cooperation.

四、 学制、学位

IV. Study Period

学制：四年

Study Period：4 Years， Maximum: 6 Years (not including military service time)

授予学位：经济学学士

Degrees Conferred: Bachelor of Economics

五、 专业特色

V. Characteristics

培养适应现代国际经贸发展的需求，以宽基础、重技能、国际化为特点，注重理论联系实际、强调实践环节和学生国际化能力的培养，在国际贸易基本理论与政策、国际贸易规则和惯例、商法、跨国经营管理、国际营销、国际投资、跨文化管理等方面提供系统的知识与技能训练。培养具有创新能力和开拓进取精神并树立全球战略意识，能够胜任在外贸、跨国公司、金融、政府、学术界的实际业务、管理、调研和策划工作，成为高素质复合型专业人才。

The program targets at fostering students with skills that needed in modern international trade and economics, with the key features of broad basis, feasible skills, and internalized background. The education program pays special emphasis on connection between theory and practice, practical link, and international skills, with extensive course work about international trade theory and policy, international trade institutions and laws, international marketing, investment, and management. After graduation from this program, students would be prepared with innovation capacity and entrepreneurial spirit and global strategy awareness which are essential for jobs such as practical business, management, survey and plan in international trading, international enterprise management, financial institutions, government, academia.

六、 主干学科

VI. Main Disciplines

- 经济学
  Economics
- 国际贸易学
  International Trade

七、 课程体系

VII. Program Structure and Modules

共分为三个课程模块：基础课程、通识课程和专业课程。

There are three course modules: Foundation Courses, General Education (GE) Courses and Major Courses.

表 1 课程体系及各课程类别最低学分要求示意图

Table 1 The Credit Requirement (Minimum) of each Course Type for Bachelor in International Economics and Trade

课程模块 Course Module	Order	课程类别 Course Type	学分 Credits
I 基础课程 Foundation Courses (FC)	A	数学与自然科学类 Mathematics and Natural Sciences (MNA)	20.0
	B	工程基础类 Engineering Fundamentals (EF)	3.0
	C	语言和文化 Language and Culture (LC)	18.0
II 通识课程 General Education Courses (GE)	D	思政类 Ideology and Politics (IP)	——
		军理类 Military Theory (MT)	——
	E	体育类 Physical Education (PE)	——
	F	核心通识课程 Core GE Courses (C-GE)	——
	G	一般通识 General GE Courses (G-GE)	4.0
	H	博雅类 Liberal Arts (LA)	
III 专业课程 Major Courses (MC)	I	核心专业基础课 Core Major Course (C-MC)	71.0
	J	一般专业课 General Major Course (G- MC)	
	L	专业实践课 Practical Major Course (PMC)	

基础课程模块，主要包括数学与自然科学类（如数学、物理等）、工基础类（如机械和电子工程训练、C 语言编程等），以及语言类。其中，《汉语》和《中国概况》是来华留学英文授课本科生的必修课。通识课程模块，旨在培养和提高学生在人文、社科等方面的知识和修养。

Foundation Courses (FC) include Mathematics and Natural Sciences courses (Mathematics, Physics,

etc.), Engineering Fundamentals courses (Mechanism, Electronics Engineering, C language, etc.). Language courses include Chinese courses for oversea student studied in China. General Education courses are courses to improve knowledge and cultivation in humanities and social sciences.

博雅类主要含暑期学校和社会实践。

Liberal Arts (LA) mainly include summer school course and social practice course.

专业课程模块，分为专业基础课程、实践课程、专业核心课程以及一般专业选修课程。学生可根据个人的兴趣及发展方向，在学业指导老师的指导下学习。

Professional course module is divided into professional basic course, practice course, professional core courses and specialized courses in general. Students can according to individual interest and the development direction, the academic learning under the guidance of school academic advisor.

八、 主要课程

VIII. Main Major courses

微观经济学、宏观经济学、国际经济学、国际贸易实务、跨国公司、国际商法、国际金融、货币金融学

Microeconomics, macroeconomics, international economics, international trade practice, multinational companies, International Business Law, international finance, monetary finance

九、 主要实践教学环节及安排

IX. Main Internship and Practical (Including experiments)

包括社会调查/ 海外学习项目、认知实习、企业实习、毕业实习、毕业论文。

Practice courses are including Investigation/Study-abroad Program, Field Practice, Corporation Internship, Graduation Internship, Graduation Project.

十、 毕业最低学分

X. Minimum Required for Graduation

毕业最低学分要求：在满足各课程类别最低学分的要求下，总学分不低于 125 学分。

Minimum Required for Graduation=125 credits, and meet the credit requirement of each Course Type at the same time.

十一、 教学进程计划

XI. Education Curriculum

the 1st Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A091011L	工科高等数学#(1) Advanced Mathematics for Engineering (1)	90	6.0	Compulsory	MNA	Examination
B25D111I	中国概况 Introduction to China	32	2.0	Compulsory	LC	Examination
B1C251131L	汉语 (1) Chinese (1)	64	4.0	Compulsory	LC	Examination
B2F050121L	航空航天概论 B Introduction to Aeronautics and Astronautics B	32	2.0	Compulsory	G-GE	Examination
B1B061011L	大学计算机基础 University Computer Foundation	44	2.0	Compulsory	G-GE	Examination
B1B321011L	工程认识 Engineering Experience and Cognition	20	0.5	Compulsory	EF	Test
B3I08111BL	管理学 Management	32	2	Compulsory	C-MC	Examination
	学期学分小计 Semester Credits		18.5			

the 2nd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A091021L	工科高等数学 (2) Advanced Algebra for Engineering (2)	86	5.0	Compulsory	MNA	Examination
B1A091031L	工科高等代数 Advanced Algebra	90	6.0	Compulsory	MNA	Examination
B1C251141L	汉语#(2) Chinese (2)	64	4.0	Compulsory	LC	Examination
C25D121I	C 语言程序设计与实践 C Programming Language Design and Practice	48	2.5	Compulsory	EF	Examination
B3I08112BL	会计学 Accounting	40	2.5	Compulsory	C-MC	Examination
B3I081160L	课程设计（会计学） Course Design (Accounting)	8	0.5	Compulsory	PMC	Test
	学期学分小计 Semester Credits		20.5			

the 3rd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1A092041L	概率统计 A Probability Statistics A	48	3.0	Compulsory	MNA	Examination
B1C251151L	汉语#(3) Chinese (3)	64	4.0	Compulsory	LC	Examination
B3I08221BL	微观经济学 Microeconomics	48	3.0	Compulsory	C-MC	Examination

B3I08221CL	公司财务 Corporate Financial	40	2.5	Compulsory	C-MC	Examination
B3I08225CL	国际经济学 International Economic	48	3.0	Compulsory	C-MC	Examination
B3I082270L	课程设计（公司财务） Course Design (Corporate Financial)	8	0.5	Compulsory	PMC	Test
	学期学分小计 Semester Credits		16.0			

the 4th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B1C251161L	汉语#(4) Chinese (4)	64	4.0	Compulsory	LC	Examination
B3I08222BL	宏观经济学 Macroeconomics	48	3.0	Compulsory	C-MC	Examination
B3I081120L	应用统计学 Applied statistics	48	3.0	Compulsory	C-MC	Examination
B3I08224BL	运筹学 Operations Research	64	4.0	Compulsory	C-MC	Examination
B3I08227CL	货币金融学 The Economics of Money, Banking and Financial Markets	48	3.0	Compulsory	C-MC	Examination
B3I082230L	课程设计（应用统计学） Course Design (Applied Statistics)	8	0.5	Compulsory	PMC	Test
B3I082240L	课程设计(运筹学) Course Design (Operations Research)	8	0.5	Compulsory	PMC	Test
	学期学分小计 Semester Credits		18.0			

the 5th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3I08374DL	国际贸易实务 Practice of International Trade	32	2.0	Compulsory	G-MC	Examination
B3I08379DL	国际商务沟通	34	2.0	Compulsory	G-MC	Examination
B3I08373DL	国际金融 International Finance	40	2.5	Compulsory	G-MC	Examination
B3I08342CL	投资学 Investment	40	2.5	Compulsory	C-MC	Examination
B25D122I	商贸汉语 (1) International Business Chinese (1)	32	2.0	Compulsory	G-MC	Examination
B3I083460L	课程设计 (投资学) Course Design (Investment)	8	0.5	Compulsory	PMC	Test
B3I083480L	课程设计（跨国公司管理） Course Design (Multinational Corporation Management)	8	0.5	Compulsory	PMC	Test
	学期学分小计 Semester Credits		12.0			

the 6th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B25D123I	商贸汉语 (2) International Business Chinese (2)	32	2.0	Compulsory	G-MC	Examination

B3I08341CL	计量经济学 Econometrics	48	3.0	Compulsory	C-MC	Examination
B3I08334CL	市场营销 Marketing	32	2.0	Compulsory	G-MC	Examination
B3I08375DL	国际商法 International Business Law	48	3.0	Compulsory	G-MC	Examination
E08B224BL	组织行为学 Organization Behavior	32	2.0	Compulsory	G-MC	Examination
B3I08376DL	跨国公司管理 Multinational Corporation Management	32	2.0	Compulsory	G-MC	Examination
B3I083310L	课程设计（市场营销） Course Design (Marketing)	8	0.5	Compulsory	PMC	Test
B3I083430L	课程设计（国际商法） Curriculum project （International Business Law）	8	0.5	Compulsory	PMC	Test
	学期学分小计 Semester Credits		15.0			

the 7th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3I08242DL	国际技术贸易 International Technology Trade	32	2.0	Compulsory	G-MC	Examination
B3J084250L	管理沟通 Management Communication	32	2.0	Compulsory	G-MC	Examination
B3J084260L	商务伦理与多元文化冲突 International Business Ethics and Cultural Conflicts	32	2.0	Compulsory	G-MC	Examination
B3J082360L	Excel 在投资理财中的应用 Application of Excel in the corporate finance	32	2.0	Compulsory	G-MC	Examination
	学期学分小计 Semester Credits		8.0			

the 8th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
B3J084240L	毕业设计 Graduation Thesis	16wks	8.0	Compulsory	PMC	Test

备注

(1) 只列出各学期必修课程目录

Only compulsory courses are listed;

(2) 课程类别的相关说明

Explanation of course type:

数学与自然科学类	Mathematics and Natural Sciences (MNA)
工程基础类	Engineering Fundamentals (EF)
语言和文化	Language and Culture (LC)
核心通识课程	Core GE Courses (C-GE)
一般通识	General GE Courses (G-GE)
核心专业基础课	Core Major Courses(C-MC)
一般专业课	General Major Course(G-MC)
专业实践课	Practical Major Course (PMC)

如下课程留学生可选修

Other courses student can Select

Course Type	Title	Credits	Note
E (PE)	体育课 Physical Education	0.5 Credit/Semester	International students can select from the 2nd semester.
H (LA)	文化素质拓展 Culture Quality Developing	1.0 Credit/Semester	International students can select from the 3rd semester.
G (General GE)	暑期学校系列课程 Courses in Summer Camp	Max 6.0 Credits /Summer Semester	International students can select the courses in summer semester (3rd semester) during the 2nd or the 3rd academic year.
F (General GE)	专业英语阅读与写作 Professional English Reading and Writing	2.0 Credits/Semester	International student can select since 5th semester.
	汉语水平考试 HSK	1.0 Credit	One credit will be offered if the international student passed HSK 3 or over.
	社会实践 Social Practice	1.0 Credit	
	其他课程 Other Courses		See the time-table at the beginning of each semester.

十二、 联系方式

XII. Contact Detail

Address: International School, Beihang University
37 Xueyuan Rd. Haidian District, Beijing, China
Post Code: 100191
Tel: 86-10-82316488 86-10-82339165
Fax: 86-10-82339165 86-10-82339326
E-mail: fso@buaa.edu.cn admission@buaa.edu.cn
Web Site: http://www.buaa.edu.cn
http://is.buaa.edu.cn

Syllabus of *Higher Mathematics for Engineers (1)*

COURSE CODE: B1A091061L
COURSE TITLE: Higher Mathematics for Engineers (1)
LECTURER: YA Li
HOURS: 90
CREDITS: 6

Course Description

This course is a first course in the calculus of one variable intended for engineering major. This course mainly concentrates on the functions of one variable, which includes topics of derivatives and integrals of functions and a variety of applications of differentiation and integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Contents and Arrangements

This course covers Chapter 1-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Functions and Models
2. Limits and Derivatives
3. Differential Rules
4. Application of Differentiation
5. Integrals
6. Applications of Integration
7. Techniques of Integration

8. Further Applications of Integration
9. Differential Equations
10. Parametric Equations and Polar Coordinates

Syllabus of *Introduction to China*

COURSE CODE: B1C251221L
COURSE TITLE: Introduction to China
LECTURER: SUN Yan
HOURS: 32
CREDITS: 2

Course Characteristics

This course is tailored for foreign students who learn their undergraduate majors in English-Medium, and it is a compulsory course categorized in general courses. General speaking, owing to limit experience and mislead of medium oversea the most of the undergraduate students have fragmental, superficial, not comprehensive and even sometimes wrong on China and Chinese society. This course will not only impart comprehensive and systematical knowledge into foreign students on Chinese geography, Custom, culture, history, Education, legal system and political system, but also introduce some hot topics to foreign students for example , reform and open to outside world policy and its achievements, religion and its policy, population and its policy, as well as foreign policy and the policies toward Hang Kong, Macao and Taiwan.

Course Target and Task

This course will fulfill the students following graduation tasks: 1. They will obtain an overall, systematical and positive understanding about China. 2. Affection will be cultivated and this course will lay a foundation to foster scholars who know China, treat China as a friend and support China. 3. This course will benefit their further study and life in China and provide them with necessary knowledge and information to understand Chinese society and communicate with Chinese. So it is very important aim for this course to provide some necessary, basic, accurate and important information to foreign students in order to understand China and the Chinese well.

Topics, Lectures and Hours Distribution

This course consists of twelve topics two practices. Twice practices will make students to experience and witness Chinese culture and Chinese society personally. Detail arrangements are as follows:

1. Basic Information and national condition, including the territory administrative division, climate etc.
2. Chinese traditional festivals and customs
3. Chinese History and Confucius
4. Reform and Open to Outside World and Its Achievements
5. Education , Religion and its Policy

6. Political System and State structure
7. Legal System
8. Population and its Policy
9. Foreign Policy and the Policies Toward HK, Macao and Taiwan visiting a Museum
10. Visiting Yuan Ming Park or Great Wall

Syllabus of *Chinese (1)*

COURSE CODE: B1C251151L
COURSE TITLE: Chinese (1)
COURSE CHINESE TITLE: 汉语（1）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course is prepared for overseas students who have never learnt Chinese or those who have a command of less than 100 new words. The course is based on the study of new words and grammar, and at the same time focuses on the cultivation of listening and speaking ability. Students need to complete primary communication tasks (including confirmation, introduction, time and direction, daily needs) which help students to acquire initially comprehension and expression ability and conduct basic conversation in Chinese in daily life and school life.

The course aims to help most students to be up to HSK1 level in listening, speaking, reading and writing aspects.

Course contents

The course contents and detail arrangement are as follows:

1. The study of Pinyin (Chinese phonetic alphabet)
2. Topics about: Name& nationality, Personal belongings, Family, Class, Birthday and Date, Work and rest, School, Room, Have a meal, Shopping, Handle affairs, Means of transportation etc.

Syllabus of *Introduction to Aeronautics and Astronautics (B)*

COURSE CODE: B2F050121L
COURSE TITLE: Introduction to Aeronautics and Astronautics（B）
RESPONSIBILITY PROFESSOR: YANG Chao, JIA Yuhong
SEMESTER: Fall/Spring
CREDITS: 2
HOURS: 26

Course Description

《The Introduction of Aeronautics and Astronautics》is a required course for the students of first year in the university. It is about basic knowledge, basic principles and development situation of aeronautics and astronautics technology. The learning of this course can stimulate the learning interest of students and improve the understanding for basic contents of aeronautics and astronautics technology.

Course Objective

The learning purpose of this course is to learn about the general development situation, basic concepts, basic knowledge of aeronautics and astronautics field, and learn about the position and function of learning specialty in aeronautics and astronautics technology.

1. Knowledge ability
2. Ability to explore problems and solve problems
3. Ability of leadership and guidance
4. Consciousness of morality and service
5. Enhance international view

Course Contents

1. General development situation of aeronautics and astronautics
2. Flight environment and flight principles
3. Energy power system of flight vehicle
4. Airborne equipments of flight vehicle
5. Flight vehicle structure

Syllabus of *University Computer Foundation*

COURSE CODE: B1B061011L
COURSE TITLE: University Computer Foundation (International College)
COURSE CHINESE TITLE: 大学计算机基础
RESPONSIBILITY PROFESSOR: CAO Qinghua
CREDITS: 2
HOURS: 44 (26 Hours in class +18Hours for experiments)

The Nature, Purpose, and Goals of this Subject

This course is a basic course for students majoring in computer science. The arrangement of the course uses the method of combining theory and practice, the key to help students master the basic skills of computer, practical operation and comprehensive application, and then improve the students' ability to analyze problems and solve problems.

The teaching of this course and the computer experiment, students should meet the basic requirements including: the basic concepts of computer, computer basic knowledge and principle, network knowledge and multimedia application technology. The general objectives for this course can be divided into the following:

1. The development of computer, new technology and modern information technology.

2. Master the conversion between carry counting system and number system method, and method of data in the computer.
3. Master computer system components and working principle.
4. Comprehensive application of common office software.
5. Basic knowledge and application of computer network.
6. Understand the concept of information security.
7. Concept and application of multimedia.
8. In accordance with the requirements, Cooperative writing papers and submit.

Course Contents

1. Computer Basic Knowledge
2. Computer System
3. Office Software
4. Computer Network
5. Information Security And Morality
6. Multimedia Technology Foundation
7. Comprehensive

Syllabus of *Engineering Knowing*

COURSE CODE: B1B321011L
COURSE TITLE: Engineering Knowing
COURSE CHINESE TITLE: 工程认识实习
LECTURER: MA Pengju
HOURS: 16
CREDITS: 1

The Text of the Course Outline

To describe the definition and connotation of subject terms of the course title;
Engineering Knowing is the first level of engineering training in the core courses of the school management. Through the summary and introduction of engineering materials, machinery manufacturing, electrical and electronic technology, testing technology, and mechanical and electrical integrated and industrial control and combination of the typical manufacturing processes, the visit of equipment and typical practice of application cases, students are enabled to have a understanding of the general picture on the above-mentioned industrial and technical fields, in order to cultivate them with preliminary engineering consciousness and practice ability.

To describe the status, characteristics and the main content of the course in the personnel training;
1. Students can have a preliminary acquaintance of the general structure of mechanical and electrical products, the used materials, processing technology and improve the manipulative ability through the disassembly practice of common and typical mechanical and electrical products.
2. By visiting the machinery manufacturing technology, students can have a certain understanding on the manufacturing process, used tools and equipment of machinery products. They can deepen the comprehension that science and technology constitute the primary productive force and improve the interest of mastering the knowledge and skills through the comparison of basic manufacturing technology and modern manufacturing technology.

Course Content and Basic Requirements

1. Mechanical Design and Manufacturing
   1) To understand engineering graphics and digital design;
   2) To comprehend the basic knowledge of machines (parts, components, machines, drive, materials, processing technology);
   3) To acquire the mechanical manufacturing process and equipment;
   4) To know the advanced manufacturing technology.
2. Bicycle Disassembly
   1) To acquire the basic components of a bicycle;
   2) To understand the typical mechanical structure;
3. Electrical and Electronic Technology
   1) To comprehend the generation and transmission of electric energy;
   2) To understand the circuit of the user side;
   3) To know motor control;
   4) To acquire the recognition and characteristics of electronic components;
   5) To comprehend the introduction of electronic technology.
4. Testing technology, Mechanical and Electrical Integration and Industrial Control Technology
   1) To know the sensing, non-electric power conversion, signal amplification and conditioning;
   2) To understand the instrument technology;
   3) To comprehend the introduction of electrical and mechanical transmission and control technology (including electrical engineering and fluid).

Syllabus of *Management*

Course Code： B3I08111B
Course Title： Management
Credits： 2
Hours： 32

COURSE OBJECTIVE

Management is a basic professional course of business administration, its purpose is to make students learn and master the basic concepts and properties of management, and its study and learning methods. Students will master the four functions of management in the process of planning, organizing, leading and controlling,and understand the history and development of management. Through the cases study, we could train student’s ability in the use of management basic principles and methods to analyze and solve the management problems in the practical work. Learning Management could laya solid foundation for students to study other management courses and engaged in management work.

CONTENTS

1. Introduction to management
2. Management yesterday and today
3. Organizational culture and environment
4. Decision-making: the essence of the manager’s job
5. Functions of planning
6. organizational structure and design
7. Motivating employees

8. Leadership
9. Control tools and techniques

Syllabus of *Higher Mathematics for Engineers (2)*

COURSE NUMBER: B1A091071L
COURSE NAME: Higher Mathematics for Engineers (2)
LECTURER: PENG Gao
HOURS: 86
CREDITS: 5

Course Description

This course is a second course in the calculus of one variable intended for engineering major. It is designed to meet the needs of students who have completed Higher Mathematics for Engineers (1) and desire to extend their skills in this subject. This course mainly concentrates on the integral calculus. Topics include an overview of integration, basic techniques for integration, a variety of applications of integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Course Contents

This course covers Chapter 6-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Applications of Integration

2. Techniques of Integration
3. Further Applications of Integration
4. Differential Equations
5. Parametric Equations and Polar Coordinates

Syllabus of *Chinese (2)*

COURSE CODE: B1C251161L
COURSE TITLE: Chinese (2)
COURSE CHINESE TITLE: 汉语（2）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course aims to help overseas students who have already had a foundation of Chinese to proficiently use Chinese Pinyin and write commonly-used Chinese characters. Students are required to have a command of more than 600 common words and 60 grammar points, at the same time further improve their understanding and communicative abilities. It also helps students to lay a firm foundation to well prepare for Chinese study in second year. It requires students to use Chinese language knowledge and skills to solve basic problems in daily life and complete primary communicative tasks in the course, such as life schedule, asking for help, explanations, descriptions and comparisons. The course emphasizes the training of listening, speaking, reading and writing to improve comprehensive abilities. At the same time, it will teach students with study methods to strengthen their confidence in language learning and guide them to study by themselves.

The course aims to help most students to be up to HSK2 level in listening, speaking, reading and writing aspects.

Course contexts, tasks and study hours

The course contents and detail arrangement are as follows:

1. Daily activities
2. Weekends
3. Chinese Courses
4. Sports
5. Personal Skills
6. Direction & Distance
7. Accommodation
8. Hobbies
9. Health
10. Age, Height and Weight
11. Dress
12. Chinese study
13. Weather

14. Food
15. City
16. Event

Syllabus of *C Language Programming*

COURSE CODE: B1B021121L
COURSE NAME: C Language Programming
COURSE CHINESE NAME: C 语言程序设计
LECTURER: WANG Li-jing
HOURS: 48
CREDITS: 2.5

The Nature, Purpose and Task of the Course

1. C language is a computer language used widely at home and abroad, which has been widely applied in the development of system software and application software with its rich and flexible control and data structure, simple and efficient expressions, clear program structure, and good portability.
2. Purpose and mission is to guide students into a great potential curriculum design of computer programming, cultivate students' logical thinking ability, abstract ability and basic computer programming skills.
3. Through the study of this course, students master a high-level programming language, learn to use the C language to solve general application problems. Learn to read simple application written in a computer programming language, master the basic structured programming method and basic steps of using computers to solve practical problems, and lay a good foundation for further study of the other basic courses and professional courses. The C programming language is a very strong practical courses,which must be required through hands-on learning of knowledge, so special emphasis on combing lecture and hands-on is necessary, while make sure every student have adequate computer conditions.
4. Key skillsaccording with graduate training target in mining issues and problem-solving: training students to think independently, active discovery, analysis, design and problem solving, and have the basic research skills for engaging in aircraft design disciplines.

Course Content

1. Programming and C language
2. Algorithm-the soul of the program
3. The simplest programming -sequential programming
4. Selective structure programming
5. Cycle structure programming
6. Batch process data by using array
7. Block-based design by using function
8. Excelingat using pointer

9. Building the data type of the user
10. Input and output to the file

Syllabus of *Accounting*

Course Code： B3I08112B
Course Title： Accounting
CREDITS:2.5
Hours： 44

COURSE OBJECTIVE

This is a general introduction to accounting and financial reporting. This course looks at the analysis of accounts and financial information from the point of view of the users, rather than the prepare of information. On completion this course, the students should understand understand the basic principles of accounting, and be able to assess the financial performance of a company.

CONTENTS

1. Introduction
2. Accounting basis
3. Cash and Accounting Receivable
4. Inventory
5. Fixed assets
6. Intangible assets
7. liabilities
8. Stockholder' Equity
9. Revenue, Expense, Income
10. Financial Statement
11. Financial statement analysis

Syllabus of *Probability and Statistics A*

COURSE CODE: A09B204I
COURSE NAME: Probability and Statistics A
LECTURER: Mahboob Iqbal
HOURS: 48
CREDITS: 3

Course Description

This course provides an introduction to probability and statistics with engineering applications. Topics include: fundamentals of statistics; basic probability models; combinatorics; random variables; discrete and continuous probability distributions; statistical estimation and testing; confidence intervals; regression; and introduction to random processes.

Course Objective

Understand random outcomes and random information

1. Learn how handle statistical information
   1) statistical analysis
   2) model building
2. Understand probability theory
3. Learn random variables and distributions
4. Know-how of random processes

Contents and Arrangements

1. Introduction to Statistics
2. Descriptive Statistics
3. Elements of Probability
4. Random Variables
5. Special Probability Distributions
6. Distributions of Sampling Statistics
7. Statistical Estimation
8. Hypothesis Testing
9. Correlation and Regression
10. Random Processes

Syllabus of *Chinese (3)*

Course Code：B1C251171L
Course Title: The Course of Chinese (3)
Credits/Course Hours：4/64
Lecturer：WEI Yangxiu

Course Objectives

The course is prepared for overseas college students who have already taken Chinese Course(1)(2). The course is based on the study of new words and grammars, at the same time it focuses on the cultivation of students' communication abilities.

The present study aims to help students to use more complicated sentences, communicate with others

based on familiar topics and be able to organize simple phrases. Meanwhile, students are expected to complete specific communicative tasks, such as daily life, school life, transportation and travel and other topics. Students have to do simple reading and writing trainings to improve their comprehensive abilities in listening, speaking, reading and writing aspects.

The main objective is to help students to be up to HSK3 level in listening, speaking, reading and writing aspects.

Course Contents

1. The course contents and detail arrangement are as follows:
2. Topic
3. Making a phone call
4. Shopping
5. Renting an apartment
6. Going to a restaurant
7. Study habits
8. Language partner
9. Life habits
10. Taking HSK test
11. Travel
12. Booking air tickets
13. Travelling experience
14. Ways of travelling

Syllabus of *Intermediate Microeconomics*

COURSE CODE: B3I08221B
COURSE TITLE: Intermediate Microeconomics
CREDITS: 3
HOURS: 48

COURSE OBJECTIVE

Microeconomics is one of the professional basic theory courses of students majoring in economics and management. Through this course, students should focus on mastering the equilibrium price theory, consumer behavior theory, theory of producer behavior, market structure, firm equilibrium theory and the theory of income distribution, so as to apply these theories and analysis methods learned to preliminary analyze related phenomena and problems in the appearing economic activities , as well as to lay the foundation for subsequent learning about this course.

CONTENTS AND ARRANGEMENTS

1. Introduction to Microeconomics

2. Elastic theory
3. Utility Theory
4. Consumer choice
5. Production theory
6. Cost and Income Theory
7. Market Structure and Firm Behavior theory
8. Game Theory
9. Factor price theory
10. General economic equilibrium theory and welfare theory
11. Market failure and government regulator

Syllabus of *International Economic*

COURSE CODE: B3I08225C
COURSE TITLE: International Economic
CREDITS: 48
HOURS:3

COURSE OBJECTIVE

International economics is the study of international resources optimal configuration, and the impact of international economic relations on the allocation of resources.

International economics is to help students understand the basic principle of open microeconomics and macroeconomics, as well as the different international economic policy impact on domestic economic welfare and the welfare of the world economy.

International economics included the basic knowledge of international economics basic concept, basic principle and basic theory. Basic theory is the pure theory of international trade, trade policy, the foreign exchange market, exchange rate, balance of payments and open economy macroeconomics theory; The basic skills of international economics refers to the use of international economics analysis methods of thinking and solve practical problems. Through learning of this course makes students understand the basic concept of international economics, understanding of international economics basic principle, grasp the observation, analysis, problem with the principle of international economics, which has the ability to solve real basic international economic problems.

CONTENTS AND ARRANGEMENTS

1. Classical Theories of International Trade
   New Classical Theories of International Trade
   Modern Trade Theories
2. Tariffs and Nontariff Barriers
   Regional Trading Arrangements
3. Balance of Payments and Foreign Exchange

4. Theories of Exchange Rate Determination
5. Balance of Payments Adjustments
6. exchange rate determination
7. International Transmission and Coordination of Macroeconomic Policies
   International Factor Movements and Multinational Enterprises

Syllabus of Chinese (4)

Course Code： B1C251181L
Course Title: The Course of Chinese (4)
Credits/Course Hours： 4/64
Lecturer:WEI Yangxiu

Course Objective

After the first three stages of Chinese study, this course will offer comprehensive training in listening, speaking, reading and writing, in order to increasingly improve students' Chinese language skills in a comprehensive way. The course aims to help students to acquire and accurately write 500 common Chinese characters, 1200 frequently-used words and 120 grammar points. Students are supposed to further understand China's social life, proficiently master language materials related to study and work and able to make correct sentences. They are also required to communicate with others naturally in some social occasions, discuss some simple topics, clearly express their own opinions, and organize brief chapters.

The teaching is based on the consolidation of syntactic structure study. At the same time it emphasizes the improvement of listening and speaking skills and adds reading and writing trainings.The main objective is to help students to be up to HSK4 level in listening, speaking, reading and writing aspects.

Course Contents

1. The course contents and detail arrangement are as follows:
2. To celebrate one's birthday
3. To call on somebody
4. To see a patient
5. To meet somebody at the airport
6. Sports games
7. To lose weight by doing exercises
8. Outdoor activities
9. The World cup the World cup games
10. Christrnas party

Syllabus of *Intermediate Macroeconomics*

COURSE CODE: B3I08222B
COURSE TITLE: Intermediate Macroeconomics
CREDITS: 3
HOURS: 48

COURSE OBJECTIVE

This is the core curriculum for undergraduates of the School of Economics and Management, which is the intermediate level of basic economics course based on the first-year principle of economics. This curriculum is intended to be a rigorous training for economics and management students to help them with economics thinking. It requires students to grasp the basic concepts of macroeconomics and the basic principles, comprehend core ideas, understand the macroeconomic policies, and contact the reform, opening up and development of China's national conditions.

CONTENTS AND ARRANGEMENTS

1. Macroeconomic Assessment
2. Connotation and Association within the Three Major Indicators
3. Theory of Economic Growth
4. Currency and Inflation
5. Unemployment and Inflation
6. International Economic
7. The Economic Cycle
8. Financial System
9. Monetary Policy
10. Planned Expenditures and Aggregate Demand
11. Fiscal Policy
12. Macroeconomic Policies and Schools

Syllabus of *Applied Statistics*

COURSE CODE: B3I08223B
COURSE TITLE: Applied Statistics
CREDITS: 2
HOURS: 32

COURSE OBJECTIVE

As an important tool of data analysis, statistics has become the essential knowledge of the researchers and practical workers in the field of economy and management. In view of the modern market and economy environment, students are supposed to master the statistical tools, and scientific description,

analysis, evaluation, prediction and decision-making of the issues from the perspective of statistical research. This course will start from methodology, and help students to master statistical analysis methods and tools. To solve the practical social and economic management issues, we will introduce students to set up a reasonable quantitative analysis model to explore the quantitative regularity of objective things, and make a correct decision finally.

The teaching objective of this course is to develop students' statistical thinking and practical ability. As the core curriculum and professional basis, this course will include the basic theory and method of statistics. By learning this course, students will set up the basic statistical ideas, develop statistical thinking and interest, be familiar with statistical language, and can explain the calculation results correctly. What's more, students will be familiar with the common statistical software (Excel, SPSS) for data analysis, and use the statistical analysis method correctly to analyze and solve practical problems in economic management.

CONTENTS AND ARRANGEMENTS

1. Parameter Estimation
2. Sampling Survey Method
3. Hypothesis Testing
4. Nonparametric Statistics
5. Analysis of Variance
6. Linear-Regression Analysis
7. Principal Component Analysis
8. Cluster Analysis
9. Discriminant Analysis

Syllabus of *Operational Research*

Course Code： B3I08224B
Course Title： Operational Research
Credits： 4
Hours： 64

COURSE OBJECTIVE

This course systematically introduces the basic theory, principles and methods of operational research to the students who major in economics and management. We set the course considering the demand of the required knowledge for studying economics and management. The main content of the course includes linear programming and dual theory, objective programming, integer programming, unconstrained/constrained non-linear optimization, dynamic programming, graph and network, queneing theory, game theory and decision analysis etc, by which the basic concepts, theories, models and methods of the main sub-disciplines of operational research. After studying this course, we hope that students will grasp the characteristic of operational problems and corresponding models, as well as the modeling methods and solution methods of typical operational models. Moreover, the student should be able to model some practical problems in management and use appropriate methods to solve it. The general aim of

this course is to help students develop the ability of quantitative analysis for modeling, analyzing, optimizing and making decision on practical managerial problems..

CONTENTS AND ARRANGEMENTS

1. Introduction
2. linear programming and simplex method
3. dual theory and sensitivity analysis
4. goal programming
5. integer programming
6. unconstrained nonlinear optimization
7. constrained nonlinear optimization
8. dynamic programming
9. graph and network optimization
10. network plan
11. queuing theory
12. of the game
13. decision-making theory -- a single objective decision

Syllabus of *The Economics of Money, Banking and Financial Markets*

Course Code： B3I08227C
Course Title： The Economics of Money, Banking and Financial Markets
Credits： 3
Hours： 48

COURSE OBJECTIVE

The course of the Economics of Money, Banking and Financial Markets focuses on the scopes of currency, monetary system, credit, interest rate, financial institutions, financial markets and instruments, international finance, financial theories, as well as financial innovation and macro-control policies. The course enables the students to use the basic concepts, knowledge and theories to interpret financial phenomena, measure the macro-control effect and give a rational thought over the working of the financial markets.

CONTENTS AND ARRANGEMENTS

1. Money, Bank and Financial Markets
2. Overview of Financial system
3. What is money
4. Interest rate
5. Behavior of Interest Rate

6. Risk Structure and Term Structure of Interest Rates
7. Rational Expectation Theory
8. Economic Analysis of Financial Regulation
9. Financial crisis
10. Banking and Financial institute management
11. Central Bank
12. Money supply process
13. Instruments of Monetary Policy
14. Operation of Monetary Policies
15. Foreign Exchange Market
16. International Financial System
17. Money Demand
18. Transmission Mechanisms of Monetary Policy
19. Money and Inflation

Syllabus of *International Trade Practice*

COURSE CODE: B3I08373D
COURSE TITLE: International Trade Practice
CREDITS: 2
HOURS: 32

COURSE OBJECTIVE

This course with strong practical, operational characteristic is a compulsory course for undergraduate students majored in Applied Economics. The goal is to enable students to understand international trade policy, law and practice, basic business processes and basic skills; training students to master the basic principles, knowledge and skills of trade terms, international transport and insurance, international settlement, contractual terms, order negotiation and fulfillment, to lay the foundation for further study of international finance or international trade, analysis of real economic problems in China's foreign trade.

CONTENTS AND ARRANGEMENTS

1. Introduction
2. International Trade Policies and Measure
3. Incoterms
4. Commodity Name, Quality, Quantity and Packaging
5. International Cargo Operations
6. International Cargo Transportation Insurance
7. Payment of the Goods Purchase Price of Foreign Trade
8. Commodity Inspection, Claims, Arbitration and Force Majeure
9. Contract Negotiation and Execution

10. Forms of Trade

Syllabus of *Business English Communication*

COURSE CODE: B3I08378D
COURSE TITLE: Business English Communication
HOURS: 32
CREDITS: 2

COURSE OBJECTIVE

The course will stress a balanced approach to communication by including coverage of correspondence, report, visual aids, interpersonal communication, listening and presentation skills , and employment communication. After studying the course, the students should gain a broad range of knowledge and skills to help them become effective communicators.

CONTENTS AND ARRANGEMENTS

1. Overview
2. Written communication
3. Listening and talking
4. Employment Communication

Syllabus of *Investment*

COURSE CODE: B3I08342C
COURSE TITLE: Investment
CREDITS: 2.5
HOURS: 40 hours

COURSE OBJECTIVE

The course focuses on the general theory of securities investment analysis, the basic method and skill of securities investment analysis, the theory and practice of securities portfolio investment, Assets and Capital Pricing. And also, covering the behavior and conception of securities investor and variations of securities price in our securities markets, it is to carry on empirical analysis. In addition, on teaching, the course emphasizes the application of theory to practice, how to apply Portfolio investment analysis, as well as the principles and model of Assets and Capital Pricing, in other words, the course has very strong practicability and operation.

This course requires students to grasp primary theory and method, to understand fluctuation of securities price, to have perceptual knowledge on circumstance on our securities market, fluctuation of security price and present state of investment securities.

CONTENTS AND ARRANGEMENTS

1. introduction
2. buying and selling securities
3. security markets
4. the valuation of riskless securities
5. the valuation of risky securities
6. the portfolio selection problem
7. portfolio analysis
8. riskfree lending and borrowing
9. the capital asset pricing model
10. factor models
11. arbitrage pricing theory
12. bond analysis
13. bond portfolio management
14. the valuation of common stock
15. options
16. futures

Business Chinese I

COURSE NUMBER:
COURSE NAME: Business Chinese
LECTURER: Li Wei
HOURS: 32
CREDITS: 2

COURSE OBJECTIVE

The course will focus on preparing the students for their career in China . The students will find real situations, challenging texts and dialogues. After studying the course, the students should be able to communicate with others in Chinese for business.

CONTENTS AND ARRANGEMENTS

1. Applying for and Accepting a Job
2. Employment and Training
3. Business Communication
4. Office Environment
5. International Exhibition, Trade Fair and Symposium

Business Chinese II

COURSE NUMBER:
COURSE NAME: Business Chinese
LECTURER: Li Wei
HOURS: 32
CREDITS: 2

COURSE OBJECTIVE

The course will focus on preparing the students for their career in China . The students will find real situations, challenging texts and dialogues. After studying the course, the students should be able to communicate with others in Chinese for business..

CONTENTS AND ARRANGEMENTS

1. Conference and Visit
2. Company Types
3. Organizational Structure of a Company
4. Price Inquiry and Negotiation
5. Goods Delivery and Payment

Syllabus of *Econometrics*

COURSE CODE: B3I08341C
COURSE TITLE: Econometrics
CREDITS: 3
HOURS: 48

COURSE OBJECTIVE

Similar to the position of Physics in Natural Science, Econometrics is one of the most "technical" courses in Social Science, and is one of the most important courses for anybody who majors in Finance, Economics and Management.

The basic purpose of this course includes:

1) Know about the position of Econometrics in the Economics subjects and its roles;
2) Master the basic and classic Econometrics methods;
3) Capable to construct the simple Econometrics model to analyze the problems in the practice;
4) Capable to further study Econometrics theories, methods and models.

CONTENTS

1. Introduction to Econometrics
2. The Simple Regression Model

3. Multiple Regression Analysis
4. Multiple Regression Analysis: Releasing the Basic Assumption
5. Special Issues on the Single Equation Model
6. Econometrics Model: Simultaneous Equations
7. How to process the Multiple Regression Analysis through a software: Examples and Practices
8. Extension to the Single Equation Model
9. Time Series Model
10. GARCH Model
11. Panel Data Model

Syllabus of *Marketing*

COURSE CODE: B3I08334C
COURSE TITLE: Marketing
CREDITS: 1
HOURS:16

COURSE OBJECTIVE

Marketing is a public elective course available for all freshman and sophomore in BUAA. Through this course, students will learn and master the basic concepts of marketing, basic principles, key marketing practice methods; lay a more solid foundation of marketing theory. Students will know more about the market. This course will guide and train the students to be able to observe preliminary marketing practical issues, raise the questions and solve the problem.

CONTENTS

1. Introduction
2. The development and innovation of Marketing
3. Market analysis
4. Product strategy in marketing
5. Pricing strategy in marketing
6. Channel strategy in marketing
7. Promotion strategy in marketing

Syllabus of *International Business Law*

COURSE CODE: B3I08374D
COURSE TITLE: International Business Law
CREDITS: 2
HOURS: 32

COURSE OBJECTIVE

The focus of this course is to introduce the students to a broad range of main laws and regulations in different countries and basic principles of international economic law in China. Topics will cover the basic principles of international economic law, sales law, business organizations and contract law, product liability law, security law, international disputes regulations, and so on.

International business law is a specialized course for students majoring international trade and international financial. The purpose of this course is to help students get a basic knowledge of international law, conventions and practices governing international trades, train them to think legally by exploring current trade issues, enable students to have practical dispute-solving abilities and prepare them to deal with international economy and trade.

CONTENTS AND ARRANGEMENTS

1. Introduction to International and Comparative Law
2. Trade in Goods
3. Services and Labor
4. Intellectual Property
5. Sales
6. The Multinational Enterprise
7. Foreign Investment
8. Dispute Settlement

Syllabus of *Organizational Behavior*

COURSE CODE: B3I08228C
COURSE TITLE: Organizational Behavior
CREDITS: 2
HOURS: 32

COURSE OBJECTIVE

This course is designed to provide the students with a foundation of knowledge and skills that could be applied to understand and manage the people side of work organizations. In this course, the students will have a chance to be acquainted of fundamental concepts, theories and practice about the nature and dynamics of individual, group and organization. After the completion of this course, the students are expected to:

(a) have a comprehensive and systematic understanding about the people-related phenomena in organizational context;

(b) develop their skills in the analysis and understanding of organizational behavior, especially to enhance their “people sensitivity”;

(c) Apply the knowledge and skills learned in this course in order to take more effective action in the organizational context and succeed through people skills

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CONTENTS

1. Introduction
2. Social cognition and attribution
3. Judgment and decision making
4. Attitude and values
5. Ability and personality
6. Work Motivation
7. Stress and emotion
8. Individuals and organization
9. Group and team
10. Communication
11. Social influence and interpersonal relationship
12. Conflict management
13. Leadership and power
14. Organizational structure and design
15. Organizational culture and change
16. Student presentation

Syllabus of *Multinational Enterprise Management*

COURSE CODE: B3I08375D
COURSE TITLE: Multinational Enterprise Management
CREDITS: 2
HOURS: 32

COURSE OBJECTIVE

Multinationals are vital for the world's international economic development. This course describes the typical foreign direct investment, international business activities, especially multinationals around the development of the theoretical basis and practical development. It also introduces about the global aspect of market strategy management, cross-cultural management of cross-border investment, strategic management, technical resources management, human resource management, business ethics management. The curriculum is designed to train students with an international investment and international business, especially multinational corporations management theory and practice related knowledge base. It analyzes the general case of international investment and multinational companies. Through this course, students will understand and master the basic theory and practical content of international investment and multinational corporations, learn to analyze and deal with practical business skills.

CONTENTS AND ARRANGEMENTS

1. Introduction
2. Multinational development: basic theory
3. Transnational direct investment: analytical framework
4. Strategic management of transnational operations
5. Organization and Management of transnational operations
6. Cultural Differences of multinational operations (a)
7. Cultural Differences of multinational operations (b)
8. Cultural Differences Transnational Operation Management (c)
9. International Technology Resource Management
10. Multinational financial management
11. International Financial Management
12. International investment and mergers and acquisitions management
13. International business risk management
14. Student exchanges and Special Report Summary

Syllabus of *International Technical Trade*

COURSE CODE: B3I08242D
COURSE TITLE: International Technical Trade
CREDITS: 2
HOURS: 32

COURSE OBJECTIVE

As important supplement to international trade and international investment activities, international technology trade is also an integral part of international business knowledge. The course covers basic concepts and structure of international technology trade, basic rules of international technology transfer, characteristics of trade of patent, trademark and Proprietary technology, price and payment of international technology trade, as well as diverse types of typical international technology trade. In addition to introduction to international technology trade, it provides relevant case study for students to find out the basic rules and laws of international technology trade, helps equip the students with basic ideas and methodologies for analyzing international technology transfer activities, and prepares them with basic knowledge on international practice and strategic management viewpoints that fit China's current situations to conduct various international technology trade projects.

CONTENTS AND ARRANGEMENTS

1. International technology trade Introduction
   The course
   The International Technical Trade Overview
   International technology transfer and international technology trade
2. International Technical Trade object

3. International Licensing Contract
4. Other form of international technology trade
5. Price and Payment of Technology Transfer
6. International technology trade tax
7. Feasibility analysis of international technology trade
8. International Technology Trade Policy and Management System

Syllabus of *Excel Application in Finance*

COURSE CODE: B3J082360
COURSE TITLE: Excel Application in Finance
CREDITS: 1.5
HOURS: 24 hours

COURSE OBJECTIVE

Spreadsheet models have been dominant vehicles for finance professionals in the business world to implement their financial knowledge. This course teaches students how to build financial models in Excel. It provide step-by-step instructions so that students can build models themselves (active learning), rather than being handed already completed spreadsheets (passive learning).

It covers standard financial models in the areas of corporate finance, time value of the money, savings and deposits, investment project valuation, bond valuation, common stock investment, portfolio problems, option pricing and application for all the above areas.

CONTENTS AND ARRANGEMENTS

1. features and techniques of financial excel model (1)
2. features and techniques of financial excel model (2)
3. Data analysis
4. Financial functions for time value of the money
5. Financial functions for security valuation
6. Excel application in capital budget decision
7. Excel application in market analysis and forecast techniques
8. Excel application in Matrices Operation
9. Excel application in generating random number
10. How to build a Monte Carlo Simulation Risk Analysis Model
11. Review
12. Final Examination

Bachelor Program of Civil Engineering

（in English）

“土木工程专业”本科教学方面（英文授课）

(This document is the text compression version of the same major taught in Chinese and only for international students)

School of Transportation Science and Engineering & International School

Beihang University, Beijing, China

北京航空航天大学交通科学与工程学院 & 国际学院

September, 2015

Bachelor Program of Civil Engineering

土木工程专业本科培养方案（全英文授课）

一、 学院简介

I. Department of Civil Engineering Introduction

土木与机场工程系成立于 1999 年，目前承载 1 个一级学科——土木工程和 1 个二级学科——道路与铁道工程的学科建设和人才培养，设有道路与铁道工程博士学位点和博士后流动站，土木工程（含 6 个二级学科）和道路与铁道工程硕士学位点。依据“高起点、求特色、国际化”的办学方针，经历十多年的发展，已形成结构工程、岩土工程、工程材料、道路与铁道工程、测绘与地理信息工程和机场道基道面工程等学科方向成熟完备的教学与科研体系。

Established in 1999, the Department of Civil Engineering at Beihang University has one first-level disciplines (Civil Engineering), one second-level disciplines (Roadway and Railway Engineering), doctoral degree and postdoctoral research center in Roadway and Railway Engineering. Aiming at high starting point, seeking characteristics and internationalization, the Department of Civil Engineering has high-quality education and research system in structural engineering, geotechnical engineering, engineering material, roadway and railway engineering, surveying and mapping and Geographic Information Engineering, and airport pavement engineering.

土木与机场工程系有教师 23 人，其中中国工程院院士 1 人（兼职教授），教授 8 人，副教授 8 人，其中 973 首席科学家 1 人，“青年千人”2 人、北航“卓越百人”岗聘副教授 2 人，100%具有博士学位，90%具有海外学习或工作经历，已经形成了一支结构合理、积极进取、创新能力强的教师队伍。

Currently there are 23 full-time faculty members in the Department of Civil Engineering dedicated to the education of more than 200 undergraduate students and 80 graduate students. All faculty members including 8 professors, 8 associate professors and 7 lecturers, earn the PhD degree from the most prestigious universities in China and oversea. 90% of our faculty members have research experience abroad in U.S., Europe and Japan. The department also has ten adjunct professors from other top universities and research institutions across the country, including a member of Chinese Academy of Engineering, one 973 Program Chief Scientists, two 1000-plan Youth Talent Titled professors and two Beihang Zhuoyue 100 titled associated professors.

二、 培养目标

II. Educational Objectives

掌握土木工程学科基本原理和基本知识,在建筑结构和岩土工程等土木工程设计、施工、监理、勘察、管理、研究等领域获得工程师基本训练、具有创新精神与实践能力的高级工程技术人才和有工程技术基础的经营管理复合型人才。

The four-year curriculum leading to the Bachelor of Engineering in Civil Engineering (BECE) aims at offering undergraduate students depth in courses considered essential for professionals in civil engineering and breadth in a wide range of technical areas through providing a variety of selective courses.

三、 毕业要求

III. Degree Requirements

学生主要学习数学、力学、计算机、工程制图、测量、土木工程材料、施工技术、工程经济等方面的基础理论与基础知识，受到计算机应用、工程实践能力的基本训练。本专业开设结构工程、岩土工程、机场工程和工程管理等领域相关课程，学生可以根据自身爱好与发展需要系统地进行修读。

Graduates need to complete courses in mathematics, mechanics, computer science, survey, engineering materials, structural mechanics and design, soils and foundations.

毕业生应获得以下几方面的知识和能力：

Graduates will have such capability upon graduation:

(1) 掌握高等数学和工程数学知识
Mastering advanced mathematics.

(2) 熟悉哲学、历史、社会学、经济学等社会科学基本知识
Understanding philosophy, history, social science, economics and management.

(3) 学习汉语
Mastering Chinese.

(4) 掌握理论力学、材料力学、结构力学、土力学、水力学等力学原理
Mastering theoretical mechanics, mechanics of materials, structural mechanics, soil mechanics, survey, structural experiments, engineering materials, construction.

(5) 了解建筑、规划、环境、交通、机械、设备、电气等相关专业的基本知识
Knowing basic concepts in environment, transportation, electronics and relevant law clauses.

四、 学制、学位

IV. Study Period

学制：四年

Study Period：4 Years， Maximum: 6 Years (not including military service time)

授予学位：工学学士

Degrees Conferred: Bachelor of Engineering

五、 专业特色

V. Characteristics

北航土木工程系致力于提供土木工程领域高质量的教学和最前沿的科研机会。在教学方面，培养本科生和研究生具有本专业坚实的科学工程理论基础以及技术专长。在科研方面，我们的专业交叉研究给学生提供有别于传统领域的多方位科研机会。

The Department of Civil Engineering at Beihang University is committed to offering a broad range of high-quality educational programs and state-of-the-art research opportunities within the field. Our educational programs in both undergraduate and graduate level provide students a sound foundation in the fundamentals of science and engineering coupled with proficient technical expertise in specialized fields, preparing students for leadership in the profession of civil engineering. Our interdisciplinary research activities give students a variety of opportunities to work on problems beyond traditional areas of the field.

六、 主干学科

VI. Main Disciplines

- 力学
  Mechanics
- 土木工程
  Civil Engineering

七、 课程体系

VII. Program Structure and Modules

共分为三个课程模块：基础课程、语言及文化课程、通识课程和专业课程。

There are three course modules: Foundation Courses, General Education (GE) Courses and Major Courses.

表 1 课程体系及各课程类别的最低学分要求示意图

Table 1 The Credit Requirement (Minimum) of each Course Type for Bachelor in Civil Engineering

课程模块 **Course Module**	**Order**	课程类别 **Course Type**	学分 **Credits**
I 基础课程 Foundation Courses (FC)	A	数学与自然科学类 Mathematics and Natural Sciences (MNA)	30.0
	B	工程基础类 Engineering Fundamentals (EF)	8.0
	C	语言和文化 Language and Culture (LC)	10.0

II 通识课程 General Education Courses (GE)	D	思政类 Ideology and Politics (IP)	——
		军理类 Military Theory (MT)	——
	E	体育类 Physical Education (PE)	——
	F	核心通识课程 Core GE Courses (C-GE)	2.0
	G	一般通识 General GE Courses (G-GE)	2.0
	H	博雅类 Liberal Arts (LA)	
III 专业课程 Major Courses (MC)	I	核心专业基础课 Core Major Course (C-MC)	59.5
	J	一般专业课 General Major Course (G-MC)	
	L	专业实践课 Practical Major Course (PMC)	

基础课程模块，主要包括数学与自然科学类（如数学、物理等）、工基础类（如机械和电子工程训练、C 语言编程等），以及语言类。其中，《汉语》和《中国概况》是来华留学英文授课本科生的必修课。通识课程模块，旨在培养和提高学生在人文、社科等方面的知识和修养。

Foundation Courses (FC) include Mathematics and Natural Sciences courses (Mathematics, Physics, etc.), Engineering Fundamentals courses (Mechanism, Electronics Engineering, C language, etc.). Language courses include Chinese courses for oversea student studied in China. General Education courses are courses to improve knowledge and cultivation in humanities and social sciences.

博雅类主要含暑期学校和社会实践。

Liberal Arts (LA) mainly include summer school course and social practice course.

专业课程模块，分为专业基础课程、实践课程（含毕业设计）、专业核心课程以及一般专业选修课程。学生可根据个人的兴趣及发展方向，在学业指导老师的指导下学习。

Major courses are divided into Fundamental Major Course, Major-oriented Course, General Major Courses and Practical Major Courses (including Graduation Project). The students can select based on their own interest and direction under the guidance of school academic advisors.

八、 毕业最低学分

VIII. Minimum Required for Graduation

毕业最低学分要求：在满足各课程类别最低学分的要求下，总学分不低于 125 学分。

Minimum Required for Graduation=125 credits, and meet the credit requirement of each Course Type at the same time.

九、 教学进程计划

IX. Education Curriculum：

the 1st Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09A101I	工科高等数学(1) Advanced Mathematics for Engineering (1)	90	6.0	Compulsory	MNA	Examination
B25D111I	中国概况 Introduction to China	32	2.0	Compulsory	LC	Examination
B1C251131L	汉语(1) Chinese (1)	64	4.0	Compulsory	LC	Examination
C05D101I	航空航天概论 B Introduction to Aeronautics and Astronautics B	32	2.0	Compulsory	C-GE	Examination
C06D101I	大学计算机基础 University Computer Foundation	44	2.0	Compulsory	G-GE	Examination
C32D101I	工程认识 Engineering Experience and Cognition	20	0.5	Compulsory	EF	Test
E13D151I	土木工程概论 Introduction to Civil Engineering	16	1.0	Compulsory	MOC	Examination
	学期学分小计 Semester Credits		17.5			

the 2nd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09A102I	工科高等数学(2) Advanced Algebra for Engineering (2)	86	5.0	Compulsory	MNA	Examination
A09A103I	工科高等代数 Advanced Algebra	80	5.0	Compulsory	MNA	Examination
A19A101I	工科大学物理(1) University Physics for Engineering (1)	64	4.0	Compulsory	MNA	Examination
B1C251141L	汉语(2) Chinese (2)	64	4.0	Compulsory	LC	Examination
C25D121I	C 语言程序设计与实践 C Programming Language	48	2.5	Compulsory	EF	Examination
G13D302I	认识实习 Basic Practice	40	1.0	Compulsory	PMC	Examination
	学期学分小计 Semester Credits		21.5			

the 3rd Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A09B204I	概率统计 A Probability Statistics A	48	3.0	Compulsory	MNA	Examination
A19A202I	工科大学物理(2) University Physics for Engineering (2)	64	4.0	Compulsory	MNA	Examination
A19A103I	基础物理实验 B(1) Fundamental Physics Experiments B(1)	28	1.5	Compulsory	MNA	Examination
E07B211I	工程材料 The Science of Engineering Materials	34	2.0	Compulsory	FMC	Examination

Code	Title	Hours	Credits	Note	Type	Evaluation
E05B201I	理论力学 A(1) The Principles of Automatic Control A(1)	64	4.0	Compulsory	FMC	Examination
G32A201I	机械工程技术训练 A Mechanical Technology Practice A	140	3.5	Compulsory	EF	Test
	学期学分小计 Semester Credits		20.0			

the 4th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
A19A104I	基础物理实验 B(2) Fundamental Physics Experiments B(2)	24	1.5	Compulsory	MNA	Examination
E05B204I	材料力学 A Mechanics of Materials A	80	5.0	Compulsory	FMC	Examination
E05B202I	理论力学 A(2) The Principles of Automatic Control A(2)	26	1.5	Compulsory	FMC	Examination
G32A204I	电子工程技术训练 Electronic Technology Practice	120	1.5	Compulsory	EF	Examination
E13C261I	测量学 Surveying	40	2.5	Compulsory	MOC	Examination
G13C369 I	测量实习 Surveying Practice	80	2.0	Compulsory	MOC	Examination
	学期学分小计 Semester Credits		14.0			

the 5th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E13C272I	结构力学 (II) Structural Mechanics (II)	48	3.0	Compulsory	FMC	Examination
E13C361I	混凝土结构设计原理 Design Principles of Structural Concrete Members	48	3.0	Compulsory	FMC	Examination
G13C362I	课程设计（混凝土楼盖） Course Design	60	1.5	Compulsory	FMC	Test
E13C372I	土力学 Soil Mechanics	32	2.0	Compulsory	FMC	Examination
B3J050701	振动力学基础 Vibration Mechanics	32	2.0	Compulsory	MOC	Examination
	学期学分小计 Semester Credits		11.5			

the 6th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E13C363I	钢结构设计原理 Basis of Steel Structural Design	40	2.5	Compulsory	FMC	Examination
G13C365I	课程设计（钢结构设计） Course Design	40	1.0	Compulsory	FMC	Examination
G13C363I	课程设计（单层厂房） Course Design	60	1.5	Compulsory	FMC	Test
Code	**Title**	**Hours**	**Credits**	**Note**	**Type**	**Evaluation**

E13C362I	混凝土结构与砌体结构设计 Design of Reinforced Concrete Structure and Masonry Structure	32	2.0	Compulsory	FMC	Examination
G13D301I	生产实习 Practical Intern	200	3.0	Compulsory	PMC	Examination
B3J050611	结构分析中的有限元法—偏理论 Finite Element Method - Theory	32	2.0	Compulsory	MOC	Examination
B3J050691	有限元法在结构分析中的应用—偏应用 Finite Element Method - Application	32	2.0	Compulsory	MOC	Examination
	学期学分小计 Semester Credits		14.0			

the 7th Semester

Code	Title	Hours	Credits	Note	Type	Evaluation
E13C366I	基础工程 Foundation Engineering	24	1.5	Compulsory	FMC	Examination
G13C366I	课程设计（基础工程） Course Design	20	0.5	Compulsory	PMC	Test
B3I050511	弹性力学 Mechanics of Elasticity	32	2.0	Compulsory	MOC	Examination
F13D466I	木结构 Timber Structures	16	1.0	Compulsory	MOC	Examination
	学期学分小计 Semester Credits		5.0			

the 8th Semester 8

Code	Title	Hours	Credits	Note	Type	Evaluation
G13D4010I	毕业设计 Graduation Thesis	16 weeks	8.0	Compulsory	PMC	Test

备注

(1) 只列出各学期必修课程目录

Only compulsory courses are listed

(2) **课程类别的相关说明**

Explanation of course type:

数学与自然科学类	Mathematics and Natural Sciences (MNA)
工程基础类	Engineering Fundamentals (EF)
语言和文化	Language and Culture (LC)
核心通识课程	Core GE Courses (C-GE)
一般通识	General GE Courses (G-GE)
核心专业基础课	Core Major Courses(C-MC)
一般专业课	General Major Course(G-MC)
专业实践课	Practical Major Course (PMC)

如下课程留学生可选修
Other courses student can select

Course Type	Title	Credits	Note
PE	体育课 Physical Education	0.5 Credit/Semester	International students can select from the 2nd semester.
LA	文化素质拓展 Culture Quality Developing	1.0 Credit/Semester	International students can select from the 3rd semester.
G-GE	暑期学校系列课程 Courses in Summer Camp	Max 6.0 Credits /Summer Semester	International students can select the courses in summer semester (3rd semester) during the 2nd or the 3rd academic year.
G-GE	专业英语阅读与写作 Professional English Reading and Writing	2.0 Credits/Semester	International student can select since 5th semester.
	汉语水平考试 HSK	1.0 credit	One credit will be offered if the international student passed HSK 3 or over.
	社会实践 Social Practice	1.0 Credit	
	其他课程 Other Courses		See the time-table at the beginning of each semester.

十、 联系方式

X. Contact Detail

International School

Address: International School, Beihang University
37 Xueyuan Rd. Haidian District, Beijing, China
Post Code: 100191
Tel: 86-10-82316488 86-10-82339165
Fax: 86-10-82339165 86-10-82339326
E-mail: fso@buaa.edu.cn admission@buaa.edu.cn
Web Site: http://www.buaa.edu.cn
http://is.buaa.edu.cn

Syllabus of *Higher Mathematics for Engineers (1)*

COURSE CODE: B1A091061L
COURSE TITLE: Higher Mathematics for Engineers (1)
LECTURER: YA Li
HOURS: 90
CREDITS: 6

Course Description

This course is a first course in the calculus of one variable intended for engineering major. This course mainly concentrates on the functions of one variable, which includes topics of derivatives and integrals of functions and a variety of applications of differentiation and integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Contents and Arrangements

This course covers Chapter 1-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Functions and Models
2. Limits and Derivatives
3. Differential Rules
4. Application of Differentiation
5. Integrals
6. Applications of Integration
7. Techniques of Integration

8. Further Applications of Integration
9. Differential Equations
10. Parametric Equations and Polar Coordinates

Syllabus of *Introduction to China*

COURSE CODE: B1C251221L
COURSE TITLE: Introduction to China
LECTURER: SUN Yan
HOURS: 32
CREDITS: 2

Course Characteristics

This course is tailored for foreign students who learn their undergraduate majors in English-Medium, and it is a compulsory course categorized in general courses. General speaking, owing to limit experience and mislead of medium oversea the most of the undergraduate students have fragmental, superficial, not comprehensive and even sometimes wrong on China and Chinese society. This course will not only impart comprehensive and systematical knowledge into foreign students on Chinese geography, Custom, culture, history, Education, legal system and political system, but also introduce some hot topics to foreign students for example , reform and open to outside world policy and its achievements, religion and its policy, population and its policy, as well as foreign policy and the policies toward Hang Kong, Macao and Taiwan.

Course Target and Task

This course will fulfill the students following graduation tasks: 1. They will obtain an overall, systematical and positive understanding about China. 2. Affection will be cultivated and this course will lay a foundation to foster scholars who know China, treat China as a friend and support China. 3. This course will benefit their further study and life in China and provide them with necessary knowledge and information to understand Chinese society and communicate with Chinese. So it is very important aim for this course to provide some necessary, basic, accurate and important information to foreign students in order to understand China and the Chinese well.

Topics, Lectures and Hours Distribution

This course consists of twelve topics two practices. Twice practices will make students to experience and witness Chinese culture and Chinese society personally. Detail arrangements are as follows:

1. Basic Information and national condition, including the territory administrative division, climate etc.
2. Chinese traditional festivals and customs
3. Chinese History and Confucius
4. Reform and Open to Outside World and Its Achievements
5. Education , Religion and its Policy
6. Political System and State structure

7. Legal System
8. Population and its Policy
9. Foreign Policy and the Policies Toward HK, Macao and Taiwan visiting a Museum
10. Visiting Yuan Ming Park or Great Wall

Syllabus of *Chinese (1)*

COURSE CODE: B1C251151L
COURSE TITLE: Chinese (1)
COURSE CHINESE TITLE: 汉语（1）
LECTURER: ZHU Mingmei
HOURS: 64
CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course is prepared for overseas students who have never learnt Chinese or those who have a command of less than 100 new words. The course is based on the study of new words and grammar, and at the same time focuses on the cultivation of listening and speaking ability. Students need to complete primary communication tasks (including confirmation, introduction, time and direction, daily needs) which help students to acquire initially comprehension and expression ability and conduct basic conversation in Chinese in daily life and school life.

The course aims to help most students to be up to HSK1 level in listening, speaking, reading and writing aspects.

Course contents

The course contents and detail arrangement are as follows:

1. The study of Pinyin (Chinese phonetic alphabet)
2. Topics about: Name& nationality, Personal belongings, Family, Class, Birthday and Date, Work and rest, School, Room, Have a meal, Shopping, Handle affairs, Means of transportation etc.

Syllabus of *Introduction to Aeronautics and Astronautics (B)*

COURSE CODE: B2F050121L
COURSE TITLE: Introduction to Aeronautics and Astronautics（B）
RESPONSIBILITY PROFESSOR: YANG Chao, JIA Yuhong
SEMESTER: Fall/Spring
CREDITS: 2
HOURS: 26

Course Description

《The Introduction of Aeronautics and Astronautics》is a required course for the students of first year in the university. It is about basic knowledge, basic principles and development situation of aeronautics and astronautics technology. The learning of this course can stimulate the learning interest of students and improve the understanding for basic contents of aeronautics and astronautics technology.

Course Objective

The learning purpose of this course is to learn about the general development situation, basic concepts, basic knowledge of aeronautics and astronautics field, and learn about the position and function of learning specialty in aeronautics and astronautics technology.

1. Knowledge ability
2. Ability to explore problems and solve problems
3. Ability of leadership and guidance
4. Consciousness of morality and service
5. Enhance international view

Course Contents

1. General development situation of aeronautics and astronautics
2. Flight environment and flight principles
3. Energy power system of flight vehicle
4. Airborne equipments of flight vehicle
5. Flight vehicle structure

Syllabus of *University Computer Foundation*

COURSE CODE: B1B061011L
COURSE TITLE: University Computer Foundation (International College)
COURSE CHINESE TITLE: 大学计算机基础
RESPONSIBILITY PROFESSOR: CAO Qinghua
CREDITS: 2
HOURS: 44 (26 Hours in class +18Hours for experiments)

The Nature, Purpose, and Goals of this Subject

This course is a basic course for students majoring in computer science. The arrangement of the course uses the method of combining theory and practice, the key to help students master the basic skills of computer, practical operation and comprehensive application, and then improve the students' ability to analyze problems and solve problems.

The teaching of this course and the computer experiment, students should meet the basic requirements including: the basic concepts of computer, computer basic knowledge and principle, network knowledge and multimedia application technology. The general objectives for this course can be divided into the following:

1. The development of computer, new technology and modern information technology.
2. Master the conversion between carry counting system and number system method, and method of data in the computer.
3. Master computer system components and working principle.
4. Comprehensive application of common office software.
5. Basic knowledge and application of computer network.
6. Understand the concept of information security.
7. Concept and application of multimedia.
8. In accordance with the requirements, Cooperative writing papers and submit.

Course Contents

1. Computer Basic Knowledge
2. Computer System
3. Office Software
4. Computer Network
5. Information Security And Morality
6. Multimedia Technology Foundation
7. Comprehensive

Syllabus of *Engineering Knowing*

COURSE CODE: B1B321011L
COURSE TITLE: Engineering Knowing
COURSE CHINESE TITLE: 工程认识实习
LECTURER: MA Pengju
HOURS: 16
CREDITS: 1

The Text of the Course Outline

To describe the definition and connotation of subject terms of the course title;
Engineering Knowing is the first level of engineering training in the core courses of the school management. Through the summary and introduction of engineering materials, machinery manufacturing, electrical and electronic technology, testing technology, and mechanical and electrical integrated and industrial control and combination of the typical manufacturing processes, the visit of equipment and typical practice of application cases, students are enabled to have a understanding of the general picture on the above-mentioned industrial and technical fields, in order to cultivate them with preliminary engineering consciousness and practice ability.

To describe the status, characteristics and the main content of the course in the personnel training;
1. Students can have a preliminary acquaintance of the general structure of mechanical and electrical products, the used materials, processing technology and improve the manipulative ability through the disassembly practice of common and typical mechanical and electrical products.
2. By visiting the machinery manufacturing technology, students can have a certain understanding on the manufacturing process, used tools and equipment of machinery products. They can deepen the comprehension that science and technology constitute the primary productive force and improve the interest of mastering the knowledge and skills through the comparison of basic manufacturing technology

and modern manufacturing technology.

Course Content and Basic Requirements

1. Mechanical Design and Manufacturing
   1) To understand engineering graphics and digital design;
   2) To comprehend the basic knowledge of machines (parts, components, machines, drive, materials, processing technology);
   3) To acquire the mechanical manufacturing process and equipment;
   4) To know the advanced manufacturing technology.
2. Bicycle Disassembly
   1) To acquire the basic components of a bicycle;
   2) To understand the typical mechanical structure;
3. Electrical and Electronic Technology
   1) To comprehend the generation and transmission of electric energy;
   2) To understand the circuit of the user side;
   3) To know motor control;
   4) To acquire the recognition and characteristics of electronic components;
   5) To comprehend the introduction of electronic technology.
4. Testing technology, Mechanical and Electrical Integration and Industrial Control Technology
   1) To know the sensing, non-electric power conversion, signal amplification and conditioning;
   2) To understand the instrument technology;
   3) To comprehend the introduction of electrical and mechanical transmission and control technology (including electrical engineering and fluid).

Course Syllabus of Introduction to Civil Engineering

Course Objective

The purpose of the course is to guide freshmen to understand the importance of civil engineering in the society and get to know the scope and basic contents of civil engineering, serving as the base for the other major courses in the undergraduate study.

Course Contents

1. History, scope and importance of civil engineering (4 hours)
2. Building material
3. Structural engineering
4. Geotechnical engineering
5. Transportation engineering
6. Construction project management

Syllabus of *Higher Mathematics for Engineers (2)*

COURSE NUMBER: B1A091071L

COURSE NAME: Higher Mathematics for Engineers (2)
LECTURER: PENG Gao
HOURS: 86
CREDITS: 5

Course Description

This course is a second course in the calculus of one variable intended for engineering major. It is designed to meet the needs of students who have completed Higher Mathematics for Engineers (1) and desire to extend their skills in this subject. This course mainly concentrates on the integral calculus. Topics include an overview of integration, basic techniques for integration, a variety of applications of integration, and an introduction to (systems of) differential equations.

Course Objective

A primary objective of this course is to develop and strengthen the students' problem-solving skills and to teach them to read, write, speak, and think in the language of mathematics. In particular, students learn how to apply the tools of calculus to a variety of problem situations. The student will be challenged to grow in mathematical maturity, and to develop and strengthen problem-solving skills. By the end of this course, students should be able to

1. Understand concepts rather than merely mimic techniques
2. Demonstrate understanding by explaining in written or oral form the meanings and important applications of concepts
3. Construct and analyze mathematical models of real-world phenomena, including both discrete and continuous models
4. Distinguish between discrete and continuous models, and make judgments about the appropriateness of the choice for a given problem
5. Understand the relationship between a process and the corresponding inverse process
6. Select between formal and approximate methods for solution of a problem, and make judgments about the appropriateness of the choice
7. Select the proper tool or tools for the task at hand

Course Contents

This course covers Chapter 6-10 of the textbook except for a few sections, below is the detailed table of contents:

1. Applications of Integration
2. Techniques of Integration
3. Further Applications of Integration
4. Differential Equations
5. Parametric Equations and Polar Coordinates

Syllabus of *Advanced Algebra in engineering*

COURSE CODE: B1A091031L
COURSE NAME: Advanced Algebra in engineering
LECTURER : ZHAO Di ; LI Hongyi
HOURS: 64 hours lectures +16 hours drills
CREDITS: 5

COURSE DESCRIPTION

Linear Algebra is an undergraduate course. It has been introduced here as a handy tool for solving practical problems. Linear Algebra has many applications in other disciplines, such as statistics, economics, engineering, physics, biology, and business. Linear Algebra is ore useful now than at almost any time in the past. Due to the computer revolution, Linear Algebra has risen to a role of prominence in the mathematical curriculum.

COURSE OBJECTIVE

Students are asked to solve similar problems or explain the basic concepts. The study of Linear Algebra instills habits of thought that are essential for a proper understanding of many areas of pure and applied mathematics.

COURSE CONTENTS

1. Determinants
2. Matrices
3. Linear dependence of vectors
4. Linear equations
5. Similar standard form
6. Inner space and Quadratic for

Syllabus of *University Physics for Engineering I, II*

COURSE CODE: B1A19101BL，B1A19201BL
COURSE TITLE: University Physics for Engineering I, II
LECTURER:
HOURS: 64
CREDITS: 4

Course Characteristics

Physics is the subject of studying the basic structure of matters, the interactions between them, and the most fundamental and universal movements of the matters and their transformations. Physics is the basis of all natural sciences. In the 2l century, physics will still

be in the leading position in the developments of science and technology.

Through College Physics teaching shall guides the students to acquire a comprehensive and systematic knowledge and understanding about the basic concepts, theories and methods of physics. In addition, through College Physics teaching shall as well enable the students to have preliminary ability of applying the knowledge.

The concrete requirements of these three levels are as follows:

1. Mastery: thoroughly understand the physical contents, master the applicable conditions, and be able to use skillfully. Generally required to be able to derive formulas.
2. Understanding: Generally not required to derive formulas but be able to analyze and calculate the relevant problems.
3. Acquaintance: know about the content. Be able to give qualitative explanation and do simple calculation. Generally not required to apply.

Course Content

1. Mechanics
   1) Particle kinematics
   2) Newton's law
   3) Work and energy
   4) Impulse and momentum
   5) Motion of rigid body
   6) Special theory of relativity

2. Electromagnetism
   1) Electrostatic field
   2) Constant magnetic field
   3) Electromagnetic induction
   4) Electromagnetic field

3. Kinetic theory of gases and Thermodynamics
   1) Kinetic theory of gases
   2) Thermodynamics

4. Mechanical vibration

5. Wave and Wave Optics
   1) Mechanical Wave
   2) Electromagnetic Wave
   3) Wave Optics

6. Modern Physical Basis

Syllabus of *Chinese (2)*

COURSE CODE: B1C251161L
COURSE TITLE: Chinese (2)
COURSE CHINESE TITLE: 汉语（2）

LECTURER: ZHU Mingmei

HOURS: 64

CREDITS: 4

Curricular Characteristics, Objectives and Tasks

The course aims to help overseas students who have already had a foundation of Chinese to proficiently use Chinese Pinyin and write commonly-used Chinese characters. Students are required to have a command of more than 600 common words and 60 grammar points, at the same time further improve their understanding and communicative abilities. It also helps students to lay a firm foundation to well prepare for Chinese study in second year. It requires students to use Chinese language knowledge and skills to solve basic problems in daily life and complete primary communicative tasks in the course, such as life schedule, asking for help, explanations, descriptions and comparisons. The course emphasizes the training of listening, speaking, reading and writing to improve comprehensive abilities. At the same time, it will teach students with study methods to strengthen their confidence in language learning and guide them to study by themselves.

The course aims to help most students to be up to HSK2 level in listening, speaking, reading and writing aspects.

Course contexts, tasks and study hours

The course contents and detail arrangement are as follows:

1. Daily activities
2. Weekends
3. Chinese Courses
4. Sports
5. Personal Skills
6. Direction & Distance
7. Accommodation
8. Hobbies
9. Health
10. Age, Height and Weight
11. Dress
12. Chinese study
13. Weather
14. Food
15. City
16. Event

Syllabus of *C Language Programming*

COURSE CODE: B1B021121L

COURSE NAME: C Language Programming

COURSE CHINESE NAME: C 语言程序设计

LECTURER: WANG Li-jing

HOURS: 48

CREDITS: 2.5

The Nature, Purpose and Task of the Course

1) C language is a computer language used widely at home and abroad, which has been widely applied in the development of system software and application software with its rich and flexible control and data structure, simple and efficient expressions, clear program structure, and good portability.
2) Purpose and mission is to guide students into a great potential curriculum design of computer programming, cultivate students' logical thinking ability, abstract ability and basic computer programming skills.
3) Through the study of this course, students master a high-level programming language, learn to use the C language to solve general application problems. Learn to read simple application written in a computer programming language, master the basic structured programming method and basic steps of using computers to solve practical problems, and lay a good foundation for further study of the other basic courses and professional courses. The C programming language is a very strong practical courses,which must be required through hands-on learning of knowledge, so special emphasis on combing lecture and hands-on is necessary, while make sure every student have adequate computer conditions.
4) Key skillsaccording with graduate training target in mining issues and problem-solving: training students to think independently, active discovery, analysis, design and problem solving, and have the basic research skills for engaging in aircraft design disciplines.

Course Content

1. Programming and C language
2. Algorithm-the soul of the program
3. The simplest programming -sequential programming
4. Selective structure programming
5. Cycle structure programming
6. Batch process data by using array
7. Block-based design by using function
8. Excelingat using pointer
9. Building the data type of the user
10. Input and output to the file

Syllabus of *Cognition practice*

Course Code：B3J13172A
Course Title：Cognition practice
Credits/Hours：1/40
Lecturer：Ye Yinghua

Course Objectives

This course is civil engineering students at the start of the professional courses soon learning, in order to enhance the perceptual knowledge, understand the professional aspects of the situation as soon as possible, for practical teaching link of arrangement to the actual project site to carry out.

Through this course of study, not only can supplement the lack of classroom teaching, for the follow-up courses to learn to lay the foundation, but also to cultivate students' ability to observe and think, to the system to understand the professional situation, consolidate and deepen the professional ideas also have great benefits.

Through the course of study, to ensure that the graduates can complete all kinds of work within the scope of the construction works, is a required professional courses.

Course Content

Students to participate in the practice, should be in the practice to guide teachers and engineering and technical personnel to help, the specific visit to the technical work and production work. Through building materials factory, prefabricated components factory, visit to different structure types of construction site and various professional exhibitions in learning, to enable students to have the understanding and the understanding to the following:

1. general civil and building structures, structures and space combinations general civil and building structures, structures and characteristics
2. preparatory work and the whole construction process before the construction of civil and building structures
3. civil engineering the basic production process (installation earthwork, masonry and reinforced concrete, structure, decoration and so on)
4. the actual level of construction technology and organization management in China at present

Syllabus of *Probability and Statistics A*

COURSE CODE: A09B204I
COURSE NAME: Probability and Statistics A
LECTURER: Mahboob Iqbal
HOURS: 48
CREDITS: 3

Course Description

This course provides an introduction to probability and statistics with engineering applications. Topics include: fundamentals of statistics; basic probability models; combinatorics; random variables; discrete and continuous probability distributions; statistical estimation and testing; confidence intervals; regression; and introduction to random processes.

Course Objective

Understand random outcomes and random information

1. Learn how handle statistical information
   1) statistical analysis
   2) model building
2. Understand probability theory
3. Learn random variables and distributions
4. Know-how of random processes

Contents and Arrangements

1. Introduction to Statistics
2. Descriptive Statistics
3. Elements of Probability
4. Random Variables
5. Special Probability Distributions
6. Distributions of Sampling Statistics
7. Statistical Estimation
8. Hypothesis Testing
9. Correlation and Regression
10. Random Processes

Syllabus of *General Physics Experiment*

COURSE CODE：A19A203，A19A204
COURSE TITLE：General Physics Experiment
COURSE CHINESE TITLE：基础物理实验 B(1)(2)
LECTURER: LI Hua
Hours: 60
Credit：3.5

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It is a beginning for students to learn systematic experimental method and technology.

Students could get basic knowledge as follows: measuring method offundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on)

and error evaluation of measuring result.

Course Contents

1. Measurement of metal elastic modulus
2. Measuring moment of inertia of a rigid body
3. A series of experiments on the air track
4. Digital measurement experiment
5. Thermal experiment
6. The application of the oscilloscope
7. Resistance measurement
8. Potentiometer and its applications
9. Thin lens and the focal length of a single spherical mirror measurement
10. Spectrometer adjustment and its application
11. Light interference experiment I（Partial wave surface method）
12. Light interference experiment II（Sub-amplitude method）

Syllabus of *General Physics Experiment*

COURSE CODE：A19A203，A19A204
COURSE TITLE：General Physics Experiment
COURSE CHINESE TITLE：基础物理实验 B(1)(2)
LECTURER: LI Hua
Hours: 60
Credit：3.5

Course Nature and Objectives

The course of general physical experiment is a fundamental compulsory course which gives students basic training of scientific experiment in science and engineering university. It is a beginning for students to learn systematic experimental method and technology.

Students could get basic knowledge as follows: measuring method offundamental physical parameters (include mechanics, thermotics, electromagnatism, optics and quantum physics), experimental methods(e.g. relative measuring method, conversion measuring method, substitution method, zero method, accumulated method, amplified method, compensation method, simulation method, modulation method and so on) and technology(e.g. air track, electrical bridge, calorimetry, geometrical optics, interference and diffraction, laser, sensor, weak signal detection, photoelectron, low temperature, AD conversion, digital acquisition and so on) , treatment of experimental data(list, plot, successive difference, regression, inversion and so on) and error evaluation of measuring result.

Course Contents

13. Measurement of metal elastic modulus
14. Measuring moment of inertia of a rigid body
15. A series of experiments on the air track
16. Digital measurement experiment
17. Thermal experiment
18. The application of the oscilloscope
19. Resistance measurement
20. Potentiometer and its applications
21. Thin lens and the focal length of a single spherical mirror measurement
22. Spectrometer adjustment and its application
23. Light interference experiment I（Partial wave surface method）
24. Light interference experiment II（Sub-amplitude method）

Science of *Engineering Material*

Course Code: B3I072310
Course Title: Science of Engineering Material
Credits/Hours: 2/32(30(Hours in class)+2(Hours for experiments))
Lecturer: ZHANG Yanhua

Course Objects

This course is a fundamental principles of materials science and engineering. The course will address the fundamentals of structure-property-processing relationships in engineering materials and relate these fundamentals to the performance of the materials. Course topics will provide students the knowledge required to produce designs of mechanical components with appropriate material and process specifications. The general objectives for this subject are as follows:

1. To provide the student with an advanced understanding of the materials used in mechanical engineering.
2. Understand the properties of engineering materials, in particular the relation of the microstructure and mechanical properties
3. Students will be able to identify and explain the features in materials microstructure which affect various materials properties.
4. To provide the student a basic understanding of the main classes of engineering materials and applications in various mechanical components or structures.

Contents

1. Introduction
2. Structure of Materials
3. Properties of engineering materials
4. Solidification and Phase Diagrams
5. Deformation of metallic materials.
6. Heat Treatment of steel

7. Ferrous Alloys
8. Non-Ferrous Alloys
9. Polymer and Ceramic

Syllabus of *Theoretical Mechanics A*

Course Code： B3I05201A
Course Chinese Name: 理论力学 A
Course English Name： Theoretical Mechanics A
Semester: Autumn & Spring Semester
Lecturer： Wang Qi, Guo Yi Yuan
Credit： 5.5/90

Nature, Target and Task of the Course

Theoretical Mechanics is not only the foundation of all mechanical courses, but also a technical basic course that focuses on statics analysis, kinematics analysis and dynamics analysis of engineering objects. It is widely used in many engineering fields. The task of Theoretical Mechanics is: to let the students grasp the basic rules and research methods of mechanical motions (including equilibrium) of a particle, a system of particles, a rigid body, and a system of rigid bodies, thus to form a necessary background for relevant follow-up courses, for learning and mastering new sciences and technology in the future; to let the students preliminarily grasp how to analyze and solve some simple engineering problems with the basic principles and methods of Theoretical Mechanics ; to cultivate the students' scientific ways of thinking, the right world view, and the related ability according to the characteristics of the course.

Course Contents

1. Introduction
2. Equilibrium of a Particle
3. Equilibrium of a Rigid Body
4. Equilibrium of Rigid Body Systems and Structures
5. Equilibrium of a Particle System
6. Dynamics of a Particle
7. Dynamics of a Particle System
8. Dynamics of a Rigid Body (part one)
9. Method of Dynamic-static
10. Lagrange Equations
11. Dynamics of a Rigid Body (part two)
12. Fundament of Mechanical Vibration

Syllabus of *Mechanical Technology Practice A*

Course No.: G32A2010
Course Title: *Mechanical Technology Practice A*
Credit/Class Hour: 3.5/140
Lecturer: Zhang Xinghua

Course Objects

Mechanical Technology Practice is an important basic technical course, which takes mechanical manufacturing as the carrier in the undergraduate college in order to cultivate students' ability of engineering practice.

1. To understand the whole technical process of production mode and machines in modern manufacturing industry from the materials, parts, to even the machines, get familiar with the main forming methods of engineering materials and the main machining methods, possess with a preliminary skill of independent operation, and lay a good foundation for the follow-up courses, graduation design, professional course design, comprehensive experiments, and extra-curricular scientific and technological practice.
2. To master the process knowledge and the knowledge of modern management in a certain extent, cultivate students' ability of engineering practice and team spirit, and improve and strengthen students' innovation consciousness and innovation ability.
3. To make the students understand and comprehend the common technology in mechanical manufacturing system through training (such as transmission technology, detection and display technology, and information synthesis and control technology, etc.), and provide a sensible understanding to the follow-up courses.
4. To carry out the ideological education, train and exercise the attitude to labor, and quality and economic concepts, strengthen students to observe labor discipline and comply with the safety rules in consciousness, and improve the overall quality of students.

Course Content

1. Practice of Heat Treatment for Surface Protection
2. Casting Practice
3. Forging and Pressing Practice
4. Welding Practice
5. Practice as the Lathe Worker
6. Active as a Miller
7. Practice as the Grinder
8. Practice as the Bench Worker
9. Practice of Wire Cut Electrical Discharge Machining
10. Laser Practice
11. Practice of Numerical Control Machining

Syllabus of *Theoretical Mechanics A*

Course Code： B3I05201A
Course Chinese Name: 理论力学 A
Course English Name： Theoretical Mechanics A
Semester: Autumn & Spring Semester
Lecturer： Wang Qi, Guo Yi Yuan
Credit： 5.5/90

Nature, Target and Task of the Course

Theoretical Mechanics is not only the foundation of all mechanical courses, but also a technical basic course that focuses on statics analysis, kinematics analysis and dynamics analysis of engineering objects. It is widely used in many engineering fields. The task of Theoretical Mechanics is: to let the students grasp the basic rules and research methods of mechanical motions (including equilibrium) of a particle, a system of particles, a rigid body, and a system of rigid bodies, thus to form a necessary background for relevant follow-up courses, for learning and mastering new sciences and technology in the future; to let the students preliminarily grasp how to analyze and solve some simple engineering problems with the basic principles and methods of Theoretical Mechanics ; to cultivate the students' scientific ways of thinking, the right world view, and the related ability according to the characteristics of the course.

Course Contents

13. Introduction
14. Equilibrium of a Particle
15. Equilibrium of a Rigid Body
16. Equilibrium of Rigid Body Systems and Structures
17. Equilibrium of a Particle System
18. Dynamics of a Particle
19. Dynamics of a Particle System
20. Dynamics of a Rigid Body (part one)
21. Method of Dynamic-static
22. Lagrange Equations
23. Dynamics of a Rigid Body (part two)
24. Fundament of Mechanical Vibration

Syllabus of *Structural Mechanics Course Syllabus*

Course Objective

Structural Mechanics is an essential course for structural engineering students. The main purpose of "Structural Mechanics" is to calculate the deformation and internal forces/stress of structures, which are significant for design and perform evaluation for structures. In this course, the main structural type

and the general computation methods will be covered. Students successfully completing this class will be able to: 1). Idealize the general real structures into reasonable analytical model; 2). Recognize the types of structures: statically determinate or statically indeterminate; 3). Calculate the internal force of statically determinate structures including truss, beam, frame, and arch.

Course Contents

1. Introduction of Structural Mechanics
2. Analysis of Statically Determinate Structures
3. Statically Determinate Beam and Frame
4. Statically Determinate Truss
5. Statically Determinate Arch
6. Influence Line
7. Principle of Virtual Work and Displacement of Structures
8. Force Method
9. Displacement Method
10. Matrix Displacement Method

Syllabus of *Mechanics of Materials (A)*

Course Code：B3I052030
Course Title：Mechanics of Materials(A)
Credits/hours： 5/64+16
Lecturer: Hua Liu

Course Objects

This course focuses on the strains, stresses, strengths, rigidities, stabilities, and failure criteria of materials under loads and offers the necessary theory for designing engineering structures from a material point of view. It is a fundamentalcoursein college of Engineering and taught in almost allcurricula related to mechanics, such as aeronautics, mechanical engineering and civil engineering. The prerequisite courses are Advanced Mathematics and Theoretical Mechanics. With this course of study, students are required to analyze the strength, rigidity and stability problems for a given member, have the ability to establish mechanical models for a practical problem and analyze them in a simple and logical manner.

Course Content

1. Introduction
2. Stress under axial loading, mechanical properties of materials
3. Deformations under Axial Loading
4. Torsion
5. Internal forces in bending

6. Bending stresses
7. Deflection of beams
8. Analysis of stress and strain
9. Strength of complex state of stresses
10. Combined loading
11. Buckling of columns
12. Further studies of bending problems
13. Strain-energy method
14. Analysis of statically indeterminate problems
15. Dynamic loading
16. Fatigue
17. Experimental stress analysis
18. Review

Syllabus of *Teaching Program for Electronic technology Training*

Course Code：G32A2040
Course Title：Electronic technology training
Credit/Hours：2/80
Lecturer：Zhang Wuqian、Cui Jian

Course Objects

The course is a public compulsory course for engineering majors of undergraduate students. Through the course, students have a more comprehensive understanding of technologies on electronic circuit assembly, design and debugging process.

Students would learn skills on characteristics of electronic components, how to identify and detect components. They would getuseful skills on circuit soldering and necessary knowledge on instruments operating. At the end of the course, students should gain the abilities on circuit analysis, instruments operation and circuit board (PCB) designing.

Contents

1. Electronic assembly technology training
2. Electronic debugging technology training
3. soldering training
4. electronic component detecting
5. circuit assembly
6. circuit debugging training
7. report writing
8. 80 hours totally, final examination in the last

Syllabus of *Surveying*

Course Code: B3J13273A
Credit hours: (32+80)hours

Course Description

It is an introductory course to geomatics and mapping, covering the equipment and hardware of the profession necessary to measure horizontal and vertical distances, in accordance with prevailing and applicable professional standards.

This course consists of 32 hours of class and 80 hours of practices that cover advance mathematical principles used for field surveying and measurement as applied to construction field engineering. The 32 class hours includes two (2), 4-hour weekend labs that will be scheduled early in the semester. The topics covered include: Development of Sketches and Proper Field Notes; Basic Level Loops and Traverses; Proper Methods of Staking and Layout of Site; Setting Points and Intersecting Lines; Batter-boards; Record Keeping with an Emphasis on Use of blueprints, & Proper Use of Surveying Equipment. This course requires extensive 80-hour lab work.

80-hour Laboratory Field practices will guide students to design and finish a complete surveying project, and help students learn how to do outdoors and indoors surveying tasks properly.

Course Objectives

Upon conclusion of this course, students will be able to:

1. Identify desired outcome of a project in order to develop criteria & procedures for measurement & research activities in accordance with prevailing & applicable professional standards.
2. Describe equipment and methods used in measuring angles, distances and elevation differences.
3. Define and demonstrate competence in Basic Algebra, Basic Geometry, and Basic Trigonometry as used in Construction layout and surveying.
4. Define and compute basic COGO coordinates as used in construction layout
5. Use Theodolite, Automatic Leveling and Total Station instruments in the field.

Course Contents

1. Course Overview & Syllabus. Surveying Fundamentals,
2. Theory of Leveling. Level Loop Adjustments
3. Electronic Distance, Angle Measurement and Reference Directions
4. Total Station Basic Operations, Construction Layout
5. Types of Errors, Accuracy and Precision; Trigonometry and Coordinate Geometry Review
6. Control Surveys
7. GPS Principles and Application
8. Topography basics and Topograhic Surveying
9. Application of Topographic maps
10. Introduction to Construction Survey
11. Building Construction Surveys
12. Route Surveys

Syllabus of *Design Basics of Concrete Structures*

Course Code：B3I13372A
Course Title: Design Basics of Concrete structures
Hours and Credits：5/128
Lecturer: Bo Diao

Course Objective

The course of “design basics of concrete structure”mainly includes the stress characteristic and the design methodof reinforced concrete and prestressed concrete members.

This course is the required course of the civil engineering specialization, and is one of civil engineering specialized core classes. The course was design to make students understan basic stress characteristic, failure modes, impact factors and design methods of reinforced concrete and prestressed concrete members under the action of bending moment, shearing force, tensile force, compressive force or torsion moment, separately.The design course includes following content: structures arrengement of the floor system, one-way slab design, sub-beam design, girder design and construction drawing.

The aim of this course is that studentswill deeply understandthe basic theory and the design method of current active design code of concrete structural members, to make a good foundation for subsequent course of engineering structure design and the construction course, as well as the graduation project.

Course Contents

This course includes part of theory plus part of experiments，mainly lectured material mechanicalperformance of concrete structures, basic mechanics characters and design theory, construction of reinforcement bars of reinforced concrete member, as well as design methods of prestressed members. The teaching content and requirement are shown in following,

1. Introduction
2. Performance of steel bars and concrete materials
3. Design methods of concrete structures
4. Flexure of reinforced concrete beams
5. Shear of reinforced concrete beams
6. Torsion of reinforced concrete beams
7. Tension of reinforced concrete member
8. Serviceability and durability of concrete structures
9. Prestressed concrete members
10. Floor structures of reinforced concrete
11. Designof reinforced concrete one way slab floor

Syllabus of *Soil Mechanics*

Course Cde：B3I13371A
Course title：Soil Mechanics
Credits/Teaching hours：3/(42+6)
Lecturer：Yang-ping Yao, Ting Luo

Course Objective

Soil mechanics is a main course of civil engineering (a technological platform course belonging to the large category), and is a basically required technical course.

Soil mechanics focuses on the properties of physical mechanics and seepage of soils, as well as the methods of analyzing and calculating the properties. The aim of this course is to make students understand the basic theory of soil mechanics, and to help students lay a theoretical foundation for learning the design of geotechnical structures, e.g., house foundations, bridge foundations, roadbeds, tunnels, etc.

Course Contents

1. Introduction
2. Physical properties of soil
3. Permeability of soil
4. Soil pressure calculation
5. One-dimensional settlement and consolidation of soil
6. Shear strength of soil
7. Earth pressure theory
8. Foundation bearing capacity
9. Stability theory of soil slope
10. Plastic limit and liquid limit test
11. Gravity test and oedometer test
12. Shear strength test

Syllabus of *Design Principle of Steel Structures*

Course Code: B3I13374A
Course Title: Design Principle of Steel Structures
Credit/ hours: 3/48 hours
Lecturer: Tu Yongqing

Course Objective

This course is a core professional course in civil engineering. It introduces the fundamental structural design process and provides a detailed discussion on the design of steel structures. Include: the basic material behavior of steel, the design methods for connections, the design of different structural components (tension members, columns under

axial compression, beams, and beam-columns);. Through the course study, the students can understand the rational use of the steel structure and the main direction of development, master the basic theory and basic knowledge of the steel structure design.

Course Contents

1. Introduction
2. Structural steel
3. Design of connections
4. Members columns under axial load
5. Beams and girders
6. Members under combined axial forces and moments
7. Introduction of design of steel roof truss

Syllabus of *Design of reinforced concrete structure and masonry structure*

Course Objectives

This course is a compulsory course in civil engineering, is a practical and closely related to current specification basic course. It aims to help students master the basic theory and practical structure design method, especially for masonry structure. It also helps students master designing and calculating method, detailing requirement and construction drawing for one –story industrial factory, multi-story and high structure and masonry structure. After the course, students should master the basic principle of structures mentioned above, have the capability to design general industrial and civil construction engineering, analyze and solve some general structure issues in the process of construction and use, and lay the theoretical foundation for following research.This course another task is to train students to carry out the design and research of high-rise building structure, and lay the foundation for the students' graduation design.

Course Content

1.Compression member
2.Single-story industrial building
3. Masonry structure
4. High-rise building overview
5. Structure scheme
6. Load
7.Frame structure

8. Shear wall structure
9. Frame shear wall structure

Syllabus of *Practice in Production*

Course Code: B3I13356B
Course Title: Practice in production
Credits/Hours: 3 / 3 weeks
Lecturer: Administrator of the class

Course Description

Production internship is a component of vital important in the education plan of airworthiness technology for undergraduates, which enhances students' practical abilities in airworthiness engineering. This outline is developed to secure a timely and standardly consummation of the education content.

The internship placement is Shenyang Aircraft Airworthiness Certification Center and students will get there with teachers. The internship is conducted according to the internship outline under the guidance of engineers and airworthiness in Shenyang Aircraft Airworthiness Certification Center, generally called non-school supervisor. When the internship is over, an internship report is required and shall be evaluated by the non-school supervisors. When the students return back school, the internship report shall be submitted to teachers within the prescribed time. The final credit is given by the teachers after check.

Course Contents

1. Airworthiness management on general aircraft
2. Certification about composite matetial
3. System safety analysis
4. Typical airborne equipment
5. Airworthiness certification on powerplant
6. Certification requirement on environment protection
7. Conformity inspection in type certification process
8. Discussion and answering question

Syllabus of *Foundation Engineering*

Course Code: B3I13376A
Course Title: FoundationEngineering
Credit/Period: 2/32

Lecturer: Feng Jinyan

Course Objective

The purpose of the course is to guide students to master the design theory for shallow foundation and pile foundation, understand the foundationtreatment in bad condition, as well to develop students' ability to design, analyze and solve foundation problems, by teaching the application of soil mechanics on practical problems in foundation design.

Course Contents

1. Introduction
2. Design Principles of shallow Foundation
3. Design Methods of shallow Foundation
4. Continuous Foundation
5. Pile Foundation
6. Retaining Structure
7. Foundation Treatment