



江蘇大學
JIANGSU UNIVERSITY

Program structure and Course Syllabus

Bachelor of

Food science and Engineering

(2023-05)

University : Jiangsu University

Major : Food science and Engineering

School : School of Food and Biological Engineering

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Introduction of the university

Jiangsu University (JSU) was founded in 1902 as a part of Sanjiang Normal University. It was retitled as Jiangsu University by integrating Jiangsu University of Science and Technology, Zhenjiang Medical College and Zhenjiang Teachers' College with the approval of the Ministry of Education of China in August, 2001. The university's undergraduate teaching was graded excellent by the Ministry of Education in 2004. It has developed to be a national comprehensive key university. According to the Evaluations of China's Universities in 2017 by China Academy of Management Science, JSU is ranked 41. It is committed to cultivating talents with 4C (Confidence, Communication, Cooperation and Creation). Now the university is launching the new orientation of schooling for high-level, research-oriented university with strength of engineering and strategy of internationalization.

JSU offers 88 undergraduate programs, 170 master programs, and 42 PhD programs in 10 academic fields: Engineering, Science, Management, Economics, Medicine, Law, Education, Literature, Art and History. The university has 13 post-doctoral research stations. Distinguished among its peers for its academic rigor, the 24 schools are competing and collaborating with each other for a high-level, research-oriented university with distinctive features and internationalization strategy.



JSU has 5,763 staff members (including those of Affiliated Hospital). 2,475 are faculty members, including 450 professors. 54% of them have got PhD degrees and over 24% have experience of overseas study. The current total enrollment of full-time students amounts to over 33,000, including 10,000 postgraduates, 1000

international students from 74 countries. Jingjiang College of Jiangsu University has an enrollment of about 10000 full-time students.

JSU has been promoting high-level research. In the recent 5 years, the total scientific research fund amounts to 2.789 billion RMB, sponsored by the governments and enterprises. The number of authorized is ranked 6 among China's universities. Five disciplines have been ranked as top 1% in ESI, such as Engineering, Clinical Medicine, Materials Science, Chemistry and Agricultural Science. Drawing on the big varieties of programs and multi-disciplinary strengths, we operate an array of research institutes and centers serving as both the academic think tanks and technological innovation source at the national and regional levels.

Semester 1			
Code	Course Name	Compulsory or Elective	Credit
38510001	Military Course	Compulsory	2
38560001	Military Skill Training	Compulsory	2
30510001	Physical Education (Basis) (I)	Compulsory	1
35510001	Introduction of Academic Planning	Compulsory	1
43510005	Advanced Mathematics C (I)	Compulsory	4
03520003	Engineering Graphics C	Compulsory	3.5
06510002	C Language Programming	Electives	3
17510001	College English (I)	Compulsory	4
09520002	Introduction to Food Science & Engineering	Compulsory	1
13510002	Inorganic Chemistry B	Compulsory	2.5
13562003	Inorganic Chemistry Experiment B	Compulsory	0.5
37510001	Ideological and Moral Cultivation and Elementary Knowledge of Law	Compulsory	3
			27.5
Semester 2			
Code	Course Name	Compulsory or Elective	Credit
44510005	College Physics C (I)	Compulsory	3
44562005	College Physics Experiment C (I)	Compulsory	0.5
17510002	College English (II)	Compulsory	4
36561011	Metalworking Internship (Cold) B	Compulsory	2
36561017	Metalworking Internship (Hot) C	Compulsory	1
13510007	Analytic Chemistry B	Compulsory	2
13562009	Analytic Chemistry Experiment B	Compulsory	0.5
43510006	Advanced Mathematics C (II)	Compulsory	3
30510002	Physical Education (Basis) (II)	Compulsory	1
37510002	Modern and Contemporary History of China	Compulsory	3
			20
Semester 3			
Code	Course Name	Compulsory or Elective	Credit
13510010	Organic Chemistry D	Compulsory	3
13562024	Organic Chemistry Experiment D	Compulsory	0.5
43510009	Linear Algebra	Compulsory	2
30510003	Physical Education (Option) (I)	Electives	1
03520039	Fundamentals of Mechanical Engineering A	Compulsory	4
03561017	Mechanical Engineering Design	Compulsory	2

00500003	Art Practice	Compulsory	1
44562006	College Physics Experiment C (II)	Compulsory	0.5
44510006	College Physics C (II)	Compulsory	2.5
08481001	Entrepreneurship Management	Compulsory	1
37510003	Basic Principles of Marxism	Compulsory	3
09520023	Food Chemistry	Compulsory	3
			23.5
Semester 4			
Code	Course Name	Compulsory or Elective	Credit
43510010	Probability Theory & Mathematical Statistic	Compulsory	3
09520014	Biochemistry B	Compulsory	4
09562008	Biochemistry Experiment B	Compulsory	1
13510008	Physical Chemistry D	Compulsory	2
13562021	Physical Chemistry Experiment D	Compulsory	0.5
09520032	Food Microbiology	Compulsory	3
09562015	Microbiology Experiment	Compulsory	1
30510004	Physical Education (Option) (II)	Electives	1
09561014	Introduction to Cognition Practice for Food Speciality	Compulsory	2
37510004	Introduction of Mao Zedong Thought and Socialism with Chinese Characteristics	Compulsory	5
			22.5
Semester 5			
Code	Course Name	Compulsory or Elective	Credit
09520021	Principles of Food Engineering A	Compulsory	4.5
09562009	Principles of Food Engineering Experiment A	Compulsory	0.5
09562013	Food Chemistry Experiment	Compulsory	0.5
00500001	Entrepreneurship Management	Compulsory	1
00500004	Labour Education	Compulsory	1
05520004	Electronics in Electrical Engineering	Compulsory	2.5
05562003	Electronics Engineering Experiment	Compulsory	0.5
			10.5
Semester 6			
Code	Course Name	Compulsory or Elective	Credit
09520019	Food Analysis and Experiment	Compulsory	6
09530026	Food Processing Technology	Compulsory	5
09562011	Food Processing Technology Experiment	Compulsory	0.5
09530051	Modern Food Detection Technology	Compulsory	2
09562019	Modern Food Detection Technology Experiment	Compulsory	0.5

09530030	Food Processing Machinery and Equipment	Compulsory	3
09562014	Food Processing Machinery and Equipment Experiment	Compulsory	0.5
09530024	Food Factory Design	Compulsory	2
09561010	Food Factory Course Design	Compulsory	2
09561011	Principles of Food Engineering Design A	Compulsory	2
			23.5
Year 4			
Code	Course Name	Compulsory or Elective	Credit
09530043	Food Nutrition and Safety	Compulsory	3
09561013	Combined Experiments for Food Specialty	Compulsory	3
09561015	Introduction to Production Practice for Food Speciality	Compulsory	2
30510005	Health Test for Undergraduate	Compulsory	0.5
39510001	The Situation and Policy	Compulsory	2
00500002	Entrepreneurship Management	Compulsory	1
09561002	Thesis Project	Compulsory	14
			25.5
Part B - Advanced Electives			
Code	Course Name	Compulsory or Elective	Credit
09520024	Physical Properties of Food A	Electives	2
09520027	Food Raw Materials A	Electives	2
09520020	Food Sensory Evaluation	Electives	2
09520005	Introduction about Innovation Method	Electives	2
09520029	Experimental Design and Data Analysis A	Electives	2
09520009	Application of Computer in Food Engineering	Electives	2
		At least 3 courses	6
Part C - Coverage Electives			
09520033	Research Methods and Thesis Writing	Electives	2
09530025	New Technology of Food Engineering	Electives	2
09530040	Nondestructive Determination Technology for Food	Electives	2
09530041	Food Physical Processing Technology	Electives	2
09530021	Food Fermentation Technology	Electives	2
09530036	Food Additives	Electives	2
09530034	Food Color Chemistry	Electives	2
09530029	Food Processing Control Technology	Electives	2
09530033	Graphic Computing in Food	Electives	2

09530035	Food Biotechnology	Electives	2
09530042	Food Logistics	Electives	2
09530019	Food Law and Regulation	Electives	2
09530038	Food Culture	Electives	2
09530018	Food Packings	Electives	2
		At least 3 courses	6
Total credit			
			165

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Engineering Graphics

课程基本信息 Course Information					
课程名称 Course Name	工程图学 C Engineering Graphics C				
课程编码 Course Code	03520003	学分 Credits	3.5		
课内学时 Course Hours	56	理论学时 Lecture Hours	48	实验学时 Experiment Hours	2
		上机学时 Programming Hours	6	实践学时 Practice Hours	0
课外学时 Home Hours	40				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>This course is a discipline which studies the expression, communication and transmission of engineering, and product information, is the carrier of engineering and product technical information, and is the language for the engineering to express and exchange technical ideas. The main contents include basic knowledge of non-mechanical major, frontier development status and trends of the non-mechanical industry. It also discusses the development status of non-mechanical related disciplines, mechanical engineering related technical standards, intellectual property, industrial policies, laws and regulations. The space concepts of electrical components and lines, spatial characteristics of components or systems and pattern representation are also included. This course enables students to grasp and use modern engineering techniques, methods and tools such as AutoCAD in practice, understand the ability of 2D graphics and 3D graphics representation, and use AutoCAD software for graphics rendering.</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims</p> <p>The course aims to provide you with functional composition and physical concept of mechanical products including:</p> <ol style="list-style-type: none"> 1. Understand the basic knowledge of non-mechanical specialty and application ability. 2. Introduction to frontier development status and trend of non-mechanical industry. 3. Introduction to the development status of non-mechanical related disciplines. 4. Introduction to mechanical engineering related technical standards. 				

	<p>intellectual property rights, industrial policies and laws and regulations.</p> <p>5. Capability to create two-dimensional and three-dimensional graphics expression: manual drawing or computer generation.</p> <p>Learning Objectives</p> <p>After successfully completing this course you should be able to:</p> <ol style="list-style-type: none"> 1. Develop scientific thinking and engineering quality, enhance engineering and innovation consciousness. 2. Understand and use modern engineering technology, methods and tools preliminarily in practice. 3. Define your life goal as an engineering student.
<p>教学内容 Topics</p>	<ol style="list-style-type: none"> 1. Drawing standards and basic drawing skills Introduction to cartographic standards, operation methods and drawing steps of ruler and gauge drawing, outline of computer software drawing, geometric drawing method of part shape forming surface (plane figure) and understand the geometric drawing methods of non-circular curves. 2. Basics of orthographic projection Geometric elements (points, lines and planes) constituting the basic body of parts and their projection analysis; generation, classification and basic properties of intersecting lines on the surface of parts; projection of points on the surface of the basic body; intersection of plane and solid -- intersection line and its projection analysis; Intersection of two solids -- intersecting line and its projection analysis. 3. Drawing, measuring and analyzing of the combination Drawing of part body (assembly) view; dimension labeling of part body (assembly) view, part shape model mapping, structural analysis of parts and interpreting part shape view with examples. 4. Axonometric drawing Basic knowledge of axonometric projection; drawing method of isometric mapping and oblique second-class axonometric drawing method. 5. A basic representation of machine parts Basic view and auxiliary view; Sectional view, Sectional drawing, Partial enlargement, simplified drawing and other specified drawing methods. 6. Standard parts and common parts Classification of parts; threaded connection, key and key connection and pin & pin connection. 7. Parts drawing

	<p>Detail drawing overview; description of typical parts, view selection of detail drawing, dimensioning of part drawings, technical requirements on part drawings, drawing frame and title bar on the part drawing, drawing part drawings with examples and interpreting part drawings with examples.</p> <p>8. Assembly drawing Assembly drawing overview and content; draw a simple assembly drawing of parts according to the part drawing and interpreting assembly drawings with examples.</p> <p>9. Computer Graphics Technology AutoCAD basic drawing and editing commands; AutoCAD dimension labeling, AutoCAD three-dimensional modeling and projection and part drawings.</p>	
<p>考核方式 Grading</p>	Evaluation	Percentage
	<p>Performance in the roll call, usual homework, classroom exercises and computer operations and testing</p>	20%
	Final exam	80%
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>“Basic requirements of engineering graphics course teaching in colleges and universities” Instructional steering committee of engineering graphics, ministry of education, 2010.</p> <p>“Mechanical drawing” Liu chaoru et al., Beijing: higher education press, 2006, fifth edition.</p> <p>“Mechanical engineering graphics” Hou hongsheng et al., Beijing: science press, 2012, third edition.</p> <p>“Mechanism mapping” Qian keqiang et al., Beijing: higher education press, 2011, third edition.</p>	

Metalworking Internship (Cold)

课程基本信息 Course Information					
课程名称 Course Name	金工实习（冷） Metalworking Internship (Cold) B				
课程编码 Course Code	36561011	学分 Credits	2		
课内学时 Course Hours	40	理论学时 Lecture Hours	0	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	40
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Metalworking Practice (Cold) C is a basic course of practical technology. It is a compulsory course for non-mechanical majors to understand the basic knowledge of mechanical engineering. Through learning, students can learn the basic technological knowledge and operation skills of mechanical manufacturing.</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims</p> <ol style="list-style-type: none"> 1. Understand the mechanical structure, the general process of mechanical manufacturing, the common processing methods, processing equipment and process equipment of mechanical parts. Correctly use processing equipment and has preliminary processing. 2. Understand the application of new equipment, technology in machinery manufacturing and training high-quality compound "new subject" talents with strong engineering practice ability, strong innovation ability and international competitiveness to meet the needs of new industries and new economy in the future 3. Establish a sense of safe and civilized production. To cultivate students' sense of responsibility, management, team, quality, cost, environmental protection and innovation, and to cultivate students' rigorous and realistic work style of "hard work, competence and practical work". 				

<p>教学内容 Topic</p>	<p>1. Have a basic understanding of mechanical production and development, engineering ethics and engineering culture. Learn the safety operation. Visit the engineering training center.</p> <p>2. Have a basic understanding of cutting principle, characteristic and application. The knowledge of type, structure and adjustment of lathe, transmission system of horizontal lathe, types, properties and applications of metal cutting tools, types of turning tools, and operation safety.</p> <p>3. The basic knowledge of the characteristics and application of milling. Understanding of the composition of milling machine and cutting motion, the general structure of the main accessories used in milling machine and the installation method of the workpiece. Understand the structure of common milling cutters and the installation of milling cutters. The ability of carry out milling plane operation.</p> <p>4. Understand the scope of work of fitters and their role in mechanical manufacturing and repair, the methods and applications of scribe, sawing, filing, drilling, tapping and sleeve threads, ability to perform basic benchmarking, sawing, filing and other benchmarking operations, the basic knowledge of mechanical parts assembly, and disassemble and assemble simple parts.</p> <p>5. Understand the basic principle, processing characteristics and application scope of NC machining, the structure of NC lathe and the programming method and processing method of NC lathe's outer circle, end face and cutting.</p> <p>6. Understanding the types, characteristics and functions of special processing, the principle, process characteristics and application scope of WEDM, EDM, laser processing (cutting, welding, marking, sculpture) and ultrasonic processing. Preliminary mastery of NC WEDM programming methods and basic operating skills.</p>	
<p>考核方式 Grading</p>	<p>Practice Report</p>	<p>30%</p>
	<p>The training results</p>	<p>70%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>1. 《Mechanical processing training》 He jianqun, China Machine Press, 2014</p>	

C Language Programming

课程基本信息 Course Information					
课程名称 Course Name	C 程序设计				
	C Language Programming				
课程编码 Course Code	06510002	学分 Credits	3		
课内学时 Course Hours	64	理论学时 Lecture Hours	32	实验学时 Experiment Hours	0
		上机学时 Programming Hours	32	实践学时 Practice Hours	0
课外学时 Home Hours	60				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>This course is a widely used programming language with both low-level and high-level languages. This language is suitable for both writing application software and system software. It has wide application in system construction, mechatronics, embedded application, automatic control, instrumentation, electronics, etc. The main contents include basic concepts, basic grammar, basic data structure construction, basic programming algorithms and programming skills, methods and techniques for designing and debugging short programs, computer system configuration and software and hardware interface design and debugging. Through this course, students will have a preliminary high-level language programming ability, and can apply the programming method to demonstrate and solve the correctness of the expressed model.</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims</p> <p>The course aims to provide you with functional composition and physical concept of mechanical products including:</p> <ol style="list-style-type: none"> 1. An introduction to C language basic concept, basic grammar. 2. An introduction to basic data structure construction. 3. Learn basic programming algorithms and programming skills. 4. Ability to design and debug short programs. 5. Basic ability to analyze and use computer to solve problems. 				

	<p>6. Basic ability to preliminary high-level language programming ability.</p> <p>Learning Objectives After successfully completing this course you should be able to:</p> <ol style="list-style-type: none"> 1. Understand the method of programming, preliminary grasp of program design ideas and methods. 2. Possess a serious attitude towards scientific work, strict working methods, practical and realistic working style and the spirit of unity and cooperation. 3. Analyze and solve problems and possess innovative thinking and creativity.
<p>教学内容 Topics</p>	<ol style="list-style-type: none"> 1. Overview of C language C language introduction; Historical background of C language; Structural features of C program; C integrated development environment. 2. Data types, operators, and expressions C language data type introduction; Constants and variables; Integer data, real data and character data; Initial value of variables; Mixed operation between various types of numerical data; Arithmetic operators and arithmetic expressions; Assignment operators and assignment expressions; Comma operators and comma expressions. 3. Simple C programming Three basic structures of a program; C language statement concept and assignment statement; Data output; Data input. Logical operation and selection structure control Relational operators and relational expressions; Logical operators and logical expressions; Conditional operators and conditional expressions; If statement and compound statement; Switch statement and break statement. 4. Cycle control While statement; Do-while statement; For statement; Nesting of loops; Comparison of several cycles; Break statement and continue statement; Examples of common algorithms. 5. One-dimensional arrays, two-dimensional arrays, and character arrays Definition and reference of one-dimensional arrays; Definition and reference of two-dimensional array; Character array; Examples of common algorithms. 6. Function General form of function definition; Function parameters and function values; Function call; Nested calls and recursive calls of functions; Array as function parameter; Local variables and global variables; Dynamic storage variables

	<p>and static storage variables.</p> <p>7. Pointers Concepts of addresses and Pointers; Pointer to variable and pointer to variable; Array pointer and pointer variable pointing to array; Pointer to the string and pointer variable to the string; Pointer array and secondary pointer.</p> <p>8. Structural body Methods for defining structure-type variables; Structure-type variable reference; Initialization of structural variables; Structure array; Pointer to structure-type data; Basic concepts of linked lists.</p> <p>9. File File type pointer; Opening and closing of files; Read and write files; File positioning.</p>	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Peacetime homework and phase testing</p>	<p>20%</p>
	<p>Computer operation test</p>	<p>20%</p>
	<p>Final exam</p>	<p>60%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>“C programming” Tan Haojiang., Tsinghua university press. June 2010. “C programming problem solving and computer instruction” Tan Haojiang., Tsinghua university press. Third edition, July 2005.</p>	

College Physics C (I) & (II)

课程基本信息 Course Information					
课程名称 Course Name	大学物理 C (I) & (II)				
	College Physics C (I) & (II)				
课程编码 Course Code	44510005\44510006		学分 Credits	5.5	
课内学时 Course Hours	112	理论学时 Lecture Hours	112	实验学时 Experiment Hours	0
		上机学时 Programing Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Physics is rich in content and involves a wide range of fields. Its basic theory is permeated in all fields of natural science and applied in all departments of production technology. It is the foundation of all fields of natural science and engineering technology. University physics course, which is based on physics, is an important compulsory general basic course for engineering students in colleges and universities.</p> <p>The basic concepts, theories and methods taught in this course are an important part of students' scientific literacy, which are necessary for a scientific worker and an engineer. This course plays an important role that cannot be replaced by other courses in laying a necessary physical foundation for students systematically, cultivating students to establish a scientific world view, and enhancing students' ability to analyze and solve problems, and cultivating students' exploration spirit and innovation consciousness.</p>				

<p>课程目标 Learning Outcome</p>	<p>Through the study of this course, we will lay the necessary physical foundation for students to fully complete university studies and further study and continuously update their knowledge after graduation.</p> <p>Course Objective 1: Knowledge Objectives. Through the study of this course, students will have a systematic understanding and correct understanding of the basic concepts, basic theories and basic methods of physics, laying a solid foundation for further study.</p> <p>Course Objective 2: Competency goals. Through the study of this course, students will learn to apply basic concepts and basic rules to analyze and deal with the basic methods of physical problems. At the same time, cultivate scientific thinking methods and general ideas for researching problems and judging right and wrong. A preliminary and rigorous training in self-learning skills, computational skills and abstract thinking skills.</p> <p>Note: The course objectives of the general course of engineering majors should cover the corresponding general standards for graduation requirements for engineering education certification;</p>
<p>教学内容 Topic</p>	<p>Chapter 1 Force and Movement</p> <p>Chapter 2 Conserved quantity and conservation law of motion</p> <p>Chapter 3 Rigid body and fluid motion</p> <p>Chapter 4 Relativity basis</p> <p>Chapter 5 Gas dynamics theory</p> <p>Chapter 6 Thermodynamic basis</p> <p>Chapter 7 Static electric field</p> <p>Chapter 8 Constant current magnetic field</p> <p>Chapter 9 Electromagnetic induction electromagnetic field theory</p> <p>Chapter 10 Mechanical Vibration and Electromagnetic Oscillation</p> <p>Chapter 11 Mechanical and Electromagnetic Waves</p> <p>Chapter 12 Optical</p> <p>Chapter 13 Early Quantum Theory and Fundamentals of Quantum Mechanics</p>
<p>考核方式 Grading</p>	<p>Total mark=regular gradex20%+midterm gradex10%+final exam gradex70%</p>

教材及参考资料 Textbooks &Other Materials	"University Physics", edited by Zhang Sanhui, Tsinghua University Press, August 2015, third edition (C7 version).
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Linear Algebra

课程基本信息 Course Information					
课程名称 Course Name	线性代数				
	Linear Algebra				
课程编码 Course Code	43510009	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	32	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Linear algebra is a mathematical theory of finite dimensional vector space and linear transformation. It consists of determinant, matrix and its operation, elementary transformation of matrix and linear equations, linear correlation of vectors, similarity matrix and quadratic form. Through teaching, students can master the basic theory and method of linear algebra, and develop the ability of theoretical analysis and logical reasoning.</p>				
课程目标 Learning Outcome	<p>Knowledge Students Master the basic theory and method of linear algebra, and have the abilities to learn related courses.</p> <p>Ability and quality To cultivate students' ability to analyze and solve practical problems with the knowledge of linear algebra.</p>				

<p>教学内容 Topic</p>	<p>Ch1 Determinant Ch2 Matrix and Its Operations Ch3 Elementary transformation of matrix and system of linear equations Ch4 Linear correlation of vector groups Ch5 Similarity Matrix and Quadratic Form</p>
<p>考核方式 Grading</p>	<p>Total mark=Final grade*70%+ Usual performance*30%</p>
<p>教材及参考资料 Textbooks &Other Materials</p>	<p>Editor-in-Chief of Higher Education Publishing House, Linear Algebra Wang Xuedi, First Edition, 2010</p>

Advanced mathematics C (I) & (II)

课程基本信息 Course Information					
课程名称 Course Name	高等数学 C (I) & (II)				
	Advanced mathematics C (I) & (II)				
课程编码 Course Code	43510005\43510006		学分 Credits	7	
课内学时 Course Hours	160	理论学时 Lecture Hours	160	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	Advanced mathematics (A) mainly covers: functions and limits, derivatives and derivatives, mean value theorems and applications of derivatives, indefinite integrals, definite integrals and their applications, vector algebra and spatial analytic geometry, differential calculus of multiple functions, multiple integrals, curve integrals and surface integrals, infinite series and ordinary differential equations. Through the study of this course, students can master the basic knowledge of higher mathematics, cultivate and improve students' abstract thinking ability, logical reasoning ability, spatial imagination ability, and the ability to analyze and solve problems with the knowledge they have learned.				
课程目标 Learning Outcome	The main task of this course is to use various teaching methods to enable students to acquire the basic concepts, basic theories and basic arithmetic skills of the following aspects: <ol style="list-style-type: none"> 1. One-dimensional function calculus. 2. Vector algebra and spatial analytic geometry. 				

	<p>3. Multivariate function calculus.</p> <p>4. Infinite series (including Fourier series).</p> <p>5. Ordinary differential equation.</p> <p>While imparting knowledge, the teacher should gradually develop students' abstract thinking ability, logical reasoning ability and spatial imagination ability, pay attention to cultivating students' more proficient computing ability, especially pay attention to cultivating students' comprehensive use of the knowledge they have learned to analyze problems and solve practical problems.</p>
<p>教学内容 Topic</p>	One-dimensional function calculus
	Vector algebra and spatial analytic geometry
	Multivariate function calculus
	Infinite series (including Fourier series)
	Ordinary differential equation
<p>考核方式 Grading</p>	Overall rating = final grade *0.7 + usual grade *0.2 + experiment * 0.1
<p>教材及参考资料 Textbooks &Other Materials</p>	<p>1. "Advanced Mathematics" (upper and lower), Department of Mathematics, Tongji University, Higher Education Press, 5th edition, July 2002.</p> <p>2. "Advanced Mathematics Workbook", self-edited material of the Department of Mathematics, Jiangsu University, August 2012</p>

Probability Theory and Mathematical Statistics

课程基本信息 Course Information					
课程名称 Course Name	概率论与数理统计 Probability Theory and Mathematical Statistics				
课程编码 Course Code	43510010	学分 Credits	3		
课内学时 Course Hours	48	理论学时 Lecture Hours	48	实验学时 Experiment Hours	0
		上机学时 Programing Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Probability theory and mathematical statistics is a mathematical discipline that studies the objective regularity of random phenomena. Its main contents are: random events and probability, random variables and their distribution, numerical characteristics of random variables, law of large Numbers and central limit theorem. Basic concepts of mathematical statistics, parameter estimation, hypothesis testing. This paper mainly introduces the basic concepts, theories and methods of probability theory and mathematical statistics. Through the study of this course, students will initially master the basic idea and method of dealing with random phenomena, and cultivate their ability to analyze and solve practical problems with probability and statistics.</p>				

<p>课程目标 Learning Outcome</p>	<p>Knowledge Master the basic theory and method of probability and statistics, and have the foundation of learning the subsequent related courses.</p> <p>Ability and quality To cultivate students' ability to analyze and solve practical problems by using the knowledge of probability and statistics</p>
<p>教学内容 Topic</p>	<p>Ch 1. Random Events and Probabilities Ch 2. Random Variables and Their Distribution Ch 3. Multi-dimensional Random Variables and Their Distribution Ch 4. Digital Features of Random Variables Ch 5 Law of Large Numbers and Central Limit Theorem Ch 6. Basic Concepts of Mathematical Statistics Ch 7. Parameter Estimation Ch 8. Hypothesis Testing</p>
<p>考核方式 Grading</p>	<p>Final grades=examination grade×70%+Performance×30%</p>
<p>教材及参考资料 Textbooks &Other Materials</p>	<p>Probability Theory and Mathematical Statistics, Sheng Su et al., Zhejiang University, Higher Education Press, 1998, 2nd Edition</p>

Modern food detection technology

课程基本信息 Course Information					
课程名称 Course Name	现代食品检测技术 Modern Food Detection Technology				
课程编码 Course Code	09530051	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	32	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	30				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Modern food detection technology is a broad and continually expanding subject as new technologies emerge, while these methods can generally be categorized as spectroscopic, electrochemical, or chromatographic. In this course, we will essentially take the cover off these "black boxes" to see how these instruments are constructed and how measurements are made from the underlying chemical and physical properties of the substance. In fact, you are likely to see instrumentation represented from other courses you've taken, demonstrating the broad impact instrumentation has in science. Quantitative problem solving will be utilized as a means to demonstrate the chemical and physical principles applied to the design and performance of instruments. The goal of this course is NOT to make you an "expert" on every type of instrumentation to be encountered in a science lab, but rather to introduce and educate you to the common principles as well as the variety of instrumentation available for chemical analysis and the type(s) of information these instruments provide.</p>				

<p>课程目标 Learning Outcome</p>	<p>Course Aims</p> <p>This course is an important professional course of food science and engineering. The principle of instruments is based on the basic knowledge about the prerequisite courses. At the same time, the course has very strong practicality. The main task is to make the students master the related detection technology based on the theory, the basic principle, basic structure, qualitative and quantitative analysis methods and simple influencing factors of analytical instruments. Through the study of this course, students will learn to use the theory and technology to develop experimental research, lay the foundation for future work and research involving food analytical method.</p> <p>Learning Objectives</p> <p>This course is an important professional course of food science and engineering. The principle of instruments is based on the basic knowledge about the prerequisite courses. At the same time, the course has very strong practicality. The main task is to make the students master the related detection technology based on the theory, the basic principle, basic structure, qualitative and quantitative analysis methods and simple influencing factors of analytical instruments. Through the study of this course, students will learn to use the theory and technology to develop experimental research, lay the foundation for future work and research involving food analytical method.</p>
<p>教学内容 Topics</p>	<p>Introduction</p> <ol style="list-style-type: none"> 1. Tasks related to food instrumental analysis 2. Classification of analytical methods 3. The concept of sensitivity and detection limits 4. Application of modern detection technology in food <p>An introduction to spectral analysis</p> <ol style="list-style-type: none"> 1. Nature of light and the electromagnetic spectrum 2. The interaction between light and matter 3. Molecules, atomic energy level and spectral production 4. Spectroscopy categories <p>UV-Vis absorption spectroscopy</p> <ol style="list-style-type: none"> 1. Basic principle 2. The main types of electronic transitions in organic compounds and main absorption band 3. Qualitative analysis 4. Quantitative Analysis

	<p>5. UV-Vis spectrophotometer Infrared absorption spectrometry</p> <ol style="list-style-type: none"> 1. Basic principle 2. Characteristic frequency of common organic compounds 3. Qualitative and quantitative analysis 4. Infrared absorption spectrometer 5. Fourier transform infrared spectrometer <p>Molecule fluorescence analysis Overview of sequential logic circuits. Analysis method of sequential logic circuit. Design of sequential logic circuits. Analysis and application of registers and counters. Application of MSI sequential logic device Atomic Absorption Spectrometry Overview of semiconductor memory. Random Access Memory (RAM). Read only memory (ROM). Expansion of memory capacity. Programmable Logic Device (PLD). An introduction to chromatography The actual rectangular wave and its parameters. Integrate the 555 timer. Use the 555 timer to form the pulse generation and conversion circuit. Use the gate circuit to form the pulse signal circuit and the integrated pulse generator. Application examples of pulse signal generation and conversion circuits.</p>					
<p>考核方式 Grading</p>	<table border="1" style="width: 100%; text-align: center;"> <tr> <td>Evaluation</td> <td>Percentage</td> </tr> </table>		Evaluation	Percentage		
	Evaluation	Percentage				
	<table border="1" style="width: 100%;"> <tr> <td style="width: 70%;">Usual homework and phase testing</td> <td style="width: 30%; text-align: center;">10%</td> </tr> </table>	Usual homework and phase testing	10%	<table border="1" style="width: 100%;"> <tr> <td style="width: 70%;"></td> <td style="width: 30%; text-align: center;">10%</td> </tr> </table>		10%
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Final exam	70%					
	70%					

| 教材及参考资料 Textbooks & Other Materials | 1. Handbook of Instrumental Techniques for Analytical Chemistry, by Frank A. Settle 2. Principles and Practice of Analytical Chemistry, By F. W. Fifield, D. Kealey, 3. Modern Analytical Chemistry, By David T Harvey 4. Modern instrumental analysis, By Kenneth A. Rub | |

Food Factory Design

课程基本信息 Course Information					
课程名称 Course Name	食品工厂设计 Food Factory Design				
课程编码 Course Code	09530024	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	32	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	20				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Curriculum Design of Food Factory Design is one of the most important professional practical courses for food science and engineering major. In this course the simulated practice to design a food factory will be achieved. Students need to gather all the necessary information themselves for designing a food factory with a specific topic. The outline includes address selection of factory, selection of technology for food production, material balance, selection of equipment and equipment arrangement, drawing and economic assessment, etc. This course helps to improve the ability of student to be an engineer.</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims</p> <p>Curriculum Design of Food Factory Design is one of the most important professional practical courses for food science and engineering major. In this course the simulated practice to design a food factory will be achieved. Students need to gather all the necessary information themselves for designing a food factory with a specific topic. The outline includes address selection of factory, selection of technology for food production, material balance, selection of equipment and equipment arrangement, drawing and economic assessment, etc. This course helps to improve the ability of student to be an engineer.</p> <p>Learning Objectives</p> <p>Curriculum Design of Food Factory Design is one of the most important professional practical courses for food science and engineering major. In this</p>				

	<p>course the simulated practice to design a food factory will be achieved. Students need to gather all the necessary information themselves for designing a food factory with a specific topic. The outline includes address selection of factory, selection of technology for food production, material balance, selection of equipment and equipment arrangement, drawing and economic assessment, etc. This course helps to improve the ability of student to be an engineer.</p>	
<p>教学内容 Topics</p>	<ol style="list-style-type: none"> 1. Design topic assignment and information searching for food factory design electromagnetic fields. 2. Location selection 3. General layout of food factory and drawing 4. Selection of production technology, material balance and drawing of process flow sheet 5. Equipment selection and arrangement 6. Economic evaluation 	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Coursework, learning attitude and class attendance</p>	<p>30%</p>
	<p>Course examination</p>	<p>70%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Zhang Guonong. Food factory design and environment protection. Beijing: China Light Industry Press, 2015. 2. Wang Weijian. Food factory design. Beijing: China Light Industry Press, 2014. 3. He Dongping. Food factory design. Beijing: China Light Industry Press, 2010. 4. Fang Ligu. Computer aided chemical drawing and design. Chemical Industry Press, 2010 	

Food Nutrition and Safety

课程基本信息 Course Information					
课程名称 Course Name	食品营养与安全 Food Nutrition and Safety				
课程编码 Course Code	09530043	学分 Credits	3		
课内学时 Course Hours	48	理论学时 Lecture Hours	40	实验学时 Experiment Hours	8
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	30				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Food safety is an important compulsory course for food science and engineering major. Through the study of this course is to understand the basic knowledge of food safety, to understand the food during processing, storage, circulation, due to the biological pollution, environmental pollution, and chemical pollution caused by food safety issues, and learn about food safety evaluation, testing and monitoring methods, types, sources, and control of food contaminants prevention measures, the characteristics of foodborne disease, prevention and management of food hygiene. Through the study of this course, students can master the basic theories of food safety, the basic testing methods, and the practical ability of food safety analysis and testing. After graduation, students can have the theoretical and practical ability to engage in food safety.</p>				
课程目标 Aims& Learning Objectives	<p>Course Aims This course covers the concepts , properties, modeling of signals and analysis of LTI systems including:</p>				

	<ol style="list-style-type: none"> 1. Concepts of signals (description, classification, common deterministic signals, transformation, operation) and properties of systems (linearity, time-invariance, causality, stability). 2. Fourier series, Fourier and Laplace transforms (definition, transforms of basic signals, properties, inverse transformation). 3. Sampling and reconstruction, modulation and demodulation, low-pass filter. 4. Time-domain relationship between signals and LTI systems (difference and differential equations, block diagrams, convolution, impulse and step responses, zero-input response, zero-state response). 5. Frequency-domain, complex frequency-domain description and response of LTI systems (system functions, block diagrams, poles and zeros, frequency responses). <p>Learning Objectives</p> <p>After successfully completing this course you should be able to:</p> <ol style="list-style-type: none"> 1. Analyze the time-domain characteristics of continuous and discrete time signals (basic concepts, time-domain characteristics, operations and transformations, etc.) 2. Calculate the continuous and discrete LTI systems response by time-domain methods, thus, be able to build the time-domain mathematical model of electrical systems, and correctly solve and analyze the model building from the time-domain. 3. Obtain the signal spectrum, analyze the frequency domain or complex frequency characteristics of signals, thus, capture the frequency domain and complex frequency domain characteristics of the signal collected or transmitted by the electrical system. 4. Solve the response of LTI continuous time system by frequency domain and complex frequency domain methods, thus, be able to determine the functions of systems, and solve basic electrical engineering problems from frequency domain and complex frequency domain analysis.
<p>教学内容 Topics</p>	<ol style="list-style-type: none"> 1. Introduction definition of food safety; History and development of food safety; The domestic and international situation of food safety; The significance of studying food safety (scientific diet -- thought); The basic content of food safety research. 2. Biologically unsafety - Food that is not safe in nature Foodborne diseases; Food poisoning; Effects of bacteria, viruses, parasites and mycotoxins on food safety. 3. Food insecurity caused by chemical contamination Chemical fertilizer and plant growth regulator; Feed and animal growth regulators; Chemical reagent; Food additives; Heavy metal.

	<p>4. Food insecurity caused by environmental pollution Air pollution; Pollution of water resources; Soil pollution.</p> <p>5. Unsafety in food processing, storage and circulation Safety in food processing; Safety of food packaging materials; Safety during food storage and transportation; Safety during food preparation.</p> <p>6. The hidden insecurity of new foods Genetic food; functional food; irradiated food.</p>	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Homework and mid-term test</p>	<p>25%</p>
	<p>Final exam</p>	<p>75%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>1. Zhong yaoguang. Food Safety. Beijing: Chemical Industry Press, 2020.</p> <p>2. Wang shuo, Wang junping. Food Safety. Beijing: Science Press, 2016.</p> <p>3. Qain he. Food Hygiene- Principles and Practices. Beijing: Chemical Industry Press, 2010</p> <p>4. https://www.cdc.gov/foodsafety/: Centers for Disease Control and Prevention- Food Safety.</p> <p>5. Steven C. Ricke, Janet R. Donaldson and Carol A. Phillips. Food Safety: Emerging Issues, Technologies and Systems. Academic Press, 2015, https://doi.org/10.1016/C2013-0-14380-2</p> <p>6. Gary Ades, Ken Leith and Patti Leith. Food Safety. Academic Press, 2016, https://doi.org/10.1016/C2014-0-02796-7</p>	

Entrepreneurship Management

课程基本信息 Course Information					
课程名称 Course Name	创业管理 Entrepreneurship Management				
课程编码 Course Code	08481001	学分 Credits	1		
课内学时 Course Hours	16	理论学时 Lecture Hours	2	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	14				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>"Entrepreneurship Management" is a professional course in the teaching plan of business administration specialty. It is an important course integrating theory with practice, with strong practicality and comprehensiveness. It aims at stimulating college students' enthusiasm for entrepreneurship and strengthens the novelty, systematicness and practicality of entrepreneurship knowledge by means of pursuing the integrity of entrepreneurship theory system. The course mainly introduces the establishment of entrepreneurial teams, analysis of entrepreneurial opportunities, preparation of entrepreneurial resources, development of entrepreneurial plans, start-up of new enterprises, new enterprise survival management, and network entrepreneurship under the new environment of globalization, informatization and cultural diversification development. It can vividly and appropriately lead the people who are determined to start a business or on the road to entrepreneurship to understand the true meaning of entrepreneurship, so that they can establish a scientific entrepreneurial concept, master the basic knowledge needed to carry out entrepreneurial activities, and possess the necessary entrepreneurship capabilities.</p>				

<p>课程目标 Aims & Learning Objectives</p>	<ol style="list-style-type: none"> 1. Develop students' entrepreneurial awareness and encourage them to start their own businesses. 2. Help students understand the role of entrepreneurship in social and economic development correctly. 3. Provide students with the knowledge reserve and skills training needed for entrepreneurship; 4. Improve students' employment ability, so that students can be competent for small and medium-sized enterprises in the job.
<p>教学内容 Topics</p>	<p>Introduction</p> <ol style="list-style-type: none"> 1. The definition of entrepreneurship, the elements of entrepreneurship, the types of entrepreneurship and the spirit of entrepreneurship in the process of entrepreneurship; 2. The upsurge of entrepreneurship; <p>Entrepreneurs and entrepreneurial teams</p> <ol style="list-style-type: none"> 2. The definition, type, quality, ability and motivation of entrepreneurs; 3. The concept, form, choice, procedure, strategy and dissolution of entrepreneurial team. <p>Entrepreneurial Opportunities and Risks</p> <ol style="list-style-type: none"> 1. The concept and origin of creativity, which changes into entrepreneurship; 2. The definition of entrepreneurship opportunities, the relationship between creativity and entrepreneurship opportunities, the types and characteristics of entrepreneurship opportunities, and the identification of entrepreneurship opportunities. 3. The definition, objectives, criteria, methods and steps of entrepreneurship opportunity evaluation; 4. Definition and characteristics of entrepreneurship risk, identification and prevention of systemic entrepreneurship risk, identification and prevention of non-systemic entrepreneurship risk; 5. Definition of entrepreneurship model, conventional and popular entrepreneurship model. <p>Entrepreneurial Resources</p> <ol style="list-style-type: none"> 1. The connotation, identification, acquisition and development of entrepreneurial resources; 2. Estimating the fund needed for starting a business, financing methods in the initial stage of starting a business (entrepreneur's own capital, borrowing, looking for partners to co-invest in starting a business, absorbing venture capital); 3. The main financing methods in the growth period of entrepreneurship (credit funds, various kinds of entrepreneurship support funds, financial leasing,

	<p>private equity funds, securities market financing).</p> <p>Business Plan</p> <ol style="list-style-type: none"> 1.Understand the common problems of College Students' entrepreneurship plan, including its meaning, function and needs. 2.Summary of business plan, enterprise and strategy, product and service, market analysis, marketing plan, production and operation, financial analysis, management team and organization, risk and its avoidance, exit strategy of venture capital; 3.Contents and methods of information collection in business plan; 4.The writing process, principles and revision of the business plan. <p>Start-up of New Enterprises</p> <ol style="list-style-type: none"> 1.The legal and ethical issues of starting a new enterprise include the choice of organizational form of the enterprise, the legal issues of starting a new enterprise, and the ethical issues of starting a new enterprise. 2.Establishment of new enterprises, including business registration, stamping, organization code certificate, tax registration and bank account opening. <p>Survival Management of New Enterprises</p> <ol style="list-style-type: none"> 1.The characteristics, advantages and problems of new enterprises, and the driving factors of new enterprises' growth; 2.The value of new enterprise strategy and the content of new enterprise strategic management; 3.Marketing characteristics of new enterprises, market re-evaluation of new enterprises and marketing strategies of new enterprises; 4.The main contents, problems and Strategies of human resources management in new enterprises; 5.New enterprise financial management skills and strategies, cash management and capital budget.
<p>考核方式 Grading</p>	<p>Classroom performance is mainly assessed by attendance times, answers to classroom questions, performance in case discussions, etc. 20%.</p> <p>The ranking of programming 25%.</p> <p>Project Design and Works: According to the outline, write a business plan covering of the key knowledge points. 55%</p>
<p>教材及参考资料 Textbooks &Other Materials</p>	<ol style="list-style-type: none"> 1. <i>Foundation of Entrepreneurship</i>. Mei Qiang, Tsinghua University Press, 2nd Edition, 2016 2. <i>Entrepreneurship Management</i>. Mei Qiang, Economic Science Press, 1st Edition, 2011 3. <i>Collection of Entrepreneurship Cases</i>. Mei Qiang and Zhao Guanbing, Economic Science Press, 1st Edition, 2009

Comprehensive experiments in food engineering

课程基本信息 Course Information					
课程名称 Course Name	食品工程综合训练 Combined Experiments for Food Specialty				
课程编码 Course Code	09561013	学分 Credits	3		
课内学时 Course Hours	3 周	理论学时 Lecture Hours	0	实验学时 Experiment Hours	3周
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	40				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Comprehensive experiments in food engineering is a core of professional basic and compulsory courses for food science and engineering major. The main content of the course is based on the courses of food chemistry, microbiology, food analysis, food processing machinery and equipment, fruit and vegetable food technology, grain and oil food technology, Livestock food technology, etc. Comprehensive experiments in food engineering is a practical and technical course of food science and engineering in universities. After completing all the courses, the students receive a system of professional experimental skills and experimental safety training before entering the graduation. The main purpose of this experiment is to deepen students' understanding of basic knowledge, be familiar with lab equipment and operation skills, cultivate good experimental habits, and improve students' comprehensive ability to use the knowledge of the Institute, therefore, the students can make a necessary preparation for the graduation thesis and the future career.</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims The experimental teaching method for students to design the experiment plan and implement themselves, and let students in an active learning state in experimental teaching activities, initiative thinking and initiative practicing, and play the subjective initiative of students. Thus improving the quality of experimental teaching, improving students' comprehensive quality and the</p>				

	<p>ability to work independently in the future.</p> <p>Learning Objectives</p> <p>Teachers should make themselves an example, words and deeds, and care for students comprehensively. According to the experimental outline, the experimental plan and the actual situation of the scene, teachers should actively create conditions, overcome difficulties, seriously organize the grouping experiment which is responsible for themselves.</p>	
<p>教学内容 Topics</p>	<p>1. One or several products' development or process optimization, the main content is "raw material - typical process - product", and determine the test items and indicators.</p> <p>2. One or several commercial products' quality inspection, and determine the test items and indicators based the relevant laws and regulations.</p> <p>3. One or several functional substance' properties testing and research which including active substance and characteristic substance, and determine the test items and indicators.</p> <p>4. Others.</p>	
<p>考核方式 Grading</p>	Evaluation	
	Usual Homework and Phase Testing	20%
	Experiment	10%
	Final Exam	70%
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>Electric Power Engineering China Machine Press</p>	

Introduction to Production Practic for Food Speciality

课程基本信息 Course Information					
课程名称 Course Name	食品专业生产实习 Introduction to Production Practic for Food Speciality				
课程编码 Course Code	09561015	学分 Credits	2		
课内学时 Course Hours	2 周	理论学时 Lecture Hours	0	实验学时 Experiment Hours	0
		上机学时 Programing Hours	0	实践学时 Practice Hours	2周
课外学时 Home Hours	20				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Production Practice is an important stage of the professional post-teaching and an indispensable practical teaching link in food professional teaching plan and also an indispensable means to guarantee the quality of engineering students. Through the production practice the students can deepen and consolidate the basic theoretical knowledge of food professionals and improve the professional skills of food,so that they can achieve the training objectives and meet the cultivating requirements in the aspects of moral, intellectual and physical. The production practice can cultivate their interest to participate in the production of practice and initiative and xercise and improve students integrate theory with practice, it also can improve their ability to analyze problems in practice and solve the problem, so that students can get a better training in research topic, design, test, review and thesis writing and they can learn the basic method of scientific research and production test, in oder to lay a solid foundation for the subsequent teaching process (course, graduation design, paper). It is appropriate for students majoring in food science and engineering.</p>				

<p>课程目标 Aims & Learning Objectives</p>	<p>Course Aims</p> <ol style="list-style-type: none"> 1. Consolidate theoretical knowledge, enable students to contact the society, understand social needs, be able to connect theory with practice. 2. Through learning and communication with workers and engineers, and related research, enable students to understand the impact of electrical engineering practices on society, health, safety, law and culture. 3. Through learning and communication with engineering and technical personnel and related research; enable students to understand the core concepts of engineering ethics and to recognize the professional responsibilities of electrical engineers. <p>Write a formal technical report.</p> <p>Learning Objectives</p> <ol style="list-style-type: none"> 1. Understand the status and trends of professional development. 2. Analyze and solve problems through classroom lectures, discussions and animation simulations. 	
<p>教学内容 Topics</p>	<ol style="list-style-type: none"> 1. Power plant internship First, carry out the education for entering the power plant and the study of safety regulations, and then introduce the whole factory. After the operation engineers of the power plant, the group will be led by the corresponding engineers to visit the production process of the electricity. 2. Substation internship First, carry out the education for entering the substation and the study of safety regulations, and then explore the whole station. The substation operation engineer leads the group to visit the learning and operation monitoring processes to understand the main equipments and their operations. 3. Power Enterprise Internship First, carry out the education for entering the power enterprise and the study of safety regulations, and the factory personnel will introduce the basic situation, products and production process of the company. Factory personnel leads the whole group to understand the organization, products and production processes of the company. 	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Ordinary Performance</p>	<p>20%</p>
	<p>Internship Report</p>	<p>50%</p>
	<p>Course Defense</p>	<p>30%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>None</p>	

Nondestructive determination technolgieer for food

课程基本信息 Course Information					
课程名称 Course Name	食品无损检测 Nondestructive Determination Technology for Food				
课程编码 Course Code	09530040	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	28	实验学时 Experiment Hours	4
		上机学时 Programming Hours	--	实践学时 Practice Hours	--
课外学时 Home Hours	40				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>This course is intended for a one-semester introductory course in food nondestructive testing technology. It presents a breadth-first overview of the discipline that assumes no prior background in food nondestructive testing technology. Course will introduce all background knowledge about food nondestructive testing technology, such as Machine vision inline measurements, NIR spectroscopy detection, Hyperspectral imaging detection, Electronic nose measurements, Colorimetric sensors measurement, Acoustic measurements, Sensor fusion measurement and some other nondestructive technologies. It is appropriate for students majoring in Food Science and Engineering.</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims This course is intended for a one-semester introductory course in food nondestructive testing technology. It presents a breadth-first overview of the discipline that assumes no prior background in food nondestructive testing technology. Course will introduce all background knowledge about food nondestructive testing technology, such as Machine vision inline measurements, NIR spectroscopy detection, Hyperspectral imaging detection, Electronic nose measurements, Colorimetric sensors measurement, Acoustic measurements, Sensor fusion measurement and some other nondestructive technologies. It is appropriate for students majoring in Food Science and Engineering.</p>				

	<p>Learning Objectives</p> <p>This course is intended for a one-semester introductory course in food nondestructive testing technology. It presents a breadth-first overview of the discipline that assumes no prior background in food nondestructive testing technology. Course will introduce all background knowledge about food nondestructive testing technology, such as Machine vision inline measurements, NIR spectroscopy detection, Hyperspectral imaging detection, Electronic nose measurements, Colorimetric sensors measurement, Acoustic measurements, Sensor fusion measurement and some other nondestructive technologies. It is appropriate for students majoring in Food Science and Engineering.</p>													
<p>教学内容 Topics</p>	<ol style="list-style-type: none"> 1. Introduction 2. Machine vision technology 3. Hyperspectral imaging technology 4. NIR spectroscopy analysis 5. Chemometrics methods 6. Raman spectroscopy technology 7. Fluorescence sensing technology 8. Electronic nose analysis 9. Colorimetric sensing technology 10. Electrochemical analysis 11. Practice part 12. Seminars 													
<p>考核方式 Grading</p>	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th data-bbox="438 1303 1236 1366">Evaluation</th> <th data-bbox="1236 1303 1457 1366">Percentage</th> </tr> </thead> <tbody> <tr> <td data-bbox="438 1366 1236 1433">Homework (Individual)</td> <td data-bbox="1236 1366 1457 1433">10%</td> </tr> <tr> <td data-bbox="438 1433 1236 1500">Report (Individual)</td> <td data-bbox="1236 1433 1457 1500">20%</td> </tr> <tr> <td data-bbox="438 1500 1236 1568">Experiment (Team)</td> <td data-bbox="1236 1500 1457 1568">25%</td> </tr> <tr> <td data-bbox="438 1568 1236 1635">Examination (Individual)</td> <td data-bbox="1236 1568 1457 1635">25%</td> </tr> <tr> <td data-bbox="438 1635 1236 1666">Project Report (Team)</td> <td data-bbox="1236 1635 1457 1666">20%</td> </tr> </tbody> </table>	Evaluation	Percentage	Homework (Individual)	10%	Report (Individual)	20%	Experiment (Team)	25%	Examination (Individual)	25%	Project Report (Team)	20%	
Evaluation	Percentage													
Homework (Individual)	10%													
Report (Individual)	20%													
Experiment (Team)	25%													
Examination (Individual)	25%													
Project Report (Team)	20%													
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Nondestructive Measurement in Food and Agro-products, Author: Xiaobo Zou 													

Food Physical Processing Technology

课程基本信息 Course Information					
课程名称 Course Name	食品物理加工技术 Food Physical Processing Technology				
课程编码 Course Code	09530041	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	28	实验学时 Experiment Hours	4
		上机学时 Programming Hours	--	实践学时 Practice Hours	
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Food physical processing technology is a professional basic course for food science and engineering majors. It takes modern acoustics, optics, electricity, magnetism and mechanics and other new physics technologies as the research object to study the improvement of traditional food processing process. Through the theoretical study and experimental operation of food physical processing technology, students can acquire the basic knowledge of food physical processing technology, master the improvement of all aspects of food processing by emerging physical processing technology, and lay a solid foundation for their future work in food processing related industries .</p>				
课程目标 Aims & Learning Objectives	<p>Course Aims Food physical processing technology is a professional basic course for food science and engineering majors. It takes modern acoustics, optics, electricity, magnetism and mechanics and other new physics technologies as the research object to study the improvement of traditional food processing process. Through the theoretical study and experimental operation of food physical processing technology, students can acquire the basic knowledge of food physical processing technology, master the improvement of all aspects of food processing by emerging physical processing technology, and lay a solid foundation for their future work in food processing related industries .</p>				

	<p>Learning Objectives</p> <p>After successfully completing this course students should be able to:</p> <p>Engineering Design:</p> <ol style="list-style-type: none"> 1. The ability to design the hardware system and software program of PLC according to specific requirements, and verifying its correctness. 2. The ability to apply engineering management and economic decision-making knowledge to the planning, design and implementation of electrical engineering problems. <p>Communication:</p> <ol style="list-style-type: none"> 1. The ability to share information with members of other disciplines actively. 2. The ability to express complex electrical engineering problems orally or in writing. <p>Team Work: effective working in an engineering team and organizing team members to work.</p>
<p>教学内容 Topics</p>	<p>Introduction to Food Physical Processing Technology</p> <ol style="list-style-type: none"> 1. Grasping the concept of food physical processing; the purpose and significance of food physical processing. 2. Grasping the current situation and prospects of food physical processing technology. 3. Understanding the main research and application scope of food physical processing technology. <p>Advances in Ultrasonic Technology applications for food processing</p> <ol style="list-style-type: none"> 1. Application of the principles, concepts, and characteristics of food ultrasonic processing technology. 2. Application of influencing factors of ultrasonic processing technology. 3. Application of basic operations of ultrasonic processing; application of ultrasonic processing. 4. Application of social, health, safety, legal, cultural and environmental factors in PLC control system design. 5. Aiming at the project application case, analyzing the background of the design object, searching the relevant data of PLC, carrying out literature research, analyzing the process of technology, and putting forward the decision-making control scheme.

	<p>Advances in High-Pressure Processing Technology (HPP) applications for food processing</p> <ol style="list-style-type: none"> 1. The concept and basic principles of ultra-high pressure processing technology. 2. Food ultra-high pressure processing technology and equipment. 3. The characteristics of ultra-high pressure processing food. 4. The effect of ultra-high pressure on food composition and quality. 	
<p>考核方式 Grading</p>	Evaluation	Percentage
	Final score based on attendance	30%
	Experiment	20%
	Team Work (Team)	10%
	Reply (Individual)	10%
	Presentation	30%
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Jingdun Jia, Donghong Liu, Haile Ma et al. - Advances in Food Physical Processing Technology(2019, Zhejiang University press) 	

Introduction to Food Science & Engineering

课程基本信息 Course Information					
课程名称 Course Name	食品科学与工程专业导论				
	Introduction to Food Science & Engineering				
课程编码 Course Code	09520002		学分 Credits	1	
课内学时 Course Hours	16	理论学时 Lecture Hours	16	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	Introduction to Food Science & Engineering is a core of professional basic courses for food science and engineering major. We mostly introduce the past, present and future of the profession (industry), the research content and development direction of the discipline, the knowledge structure and level of senior technical personnel of food science and engineering, and the quality and learning methods of professional talents.				
课程目标 Aims & Learning Objectives	Introduction to Food Science & Engineering is a core of professional basic courses for food science and engineering major. We mostly introduce the past, present and future of the profession (industry), the research content and development direction of the discipline, the knowledge structure and level of senior technical personnel of food science and engineering, and the quality and learning methods of professional talents.				

<p>教学内容 Topics</p>	<p>Chapter 1 Overview of food science and engineering profession</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. The connotation of science, technology and engineering 2. The connotation of food science, food technology and food engineering 3. Definition of food science and engineering 4. The connotation of food science and engineering discipline 5. The past, present and future of food science and engineering discipline 6. System of professional talent training in food science and engineering discipline <p>Teaching Object</p> <ol style="list-style-type: none"> 1. Understand the meaning of science, technology and engineering 2. Master the connotation of food science and engineering 3. Understand the past, present and future of food science and engineering discipline 4. Understand the system of professional talent training in food science and engineering discipline <p>Chapter 2 Overview of food industry</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Problems and opportunities facing the food industry 2. China and the world food industry system 3. The characteristics of food industry and its position in the national economy 4. Development trend of food industry <p>Teaching Object</p> <ol style="list-style-type: none"> 1. Master China and the world food industry system 2. Understand the characteristics of the food industry and its position in the national economy 3. Understand the food industry development trend <p>Chapter3 Introduction of food science and engineering professional personnel training program</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. General framework for the cultivation of food science and engineering specialty 2. Training plan system structure of food science and engineering specialty 3. Professional training program of food science and engineering specialty 4. Analysis of the core main line in the cultivation of professional ability of food science and engineering 5. Analysis of application case-industrialized food
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	<p>Teaching Object</p> <ol style="list-style-type: none"> 1. Understand the general framework of food science and engineering 2. Understand training plan system structure of food science and engineering specialty 3. Familiar with food science and engineering professional training program 4. Master the core of food science and engineering professional ability training <p>Chapter4 Seminar</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Seminar one: Food industry hot topics 2. Seminar two: Food research trends and frontiers <p>Teaching Object</p> <ol style="list-style-type: none"> 1. Understand the hot spots in the food industry 2. Understand the trends and frontiers of food research 	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Final score based on attendance</p>	<p>10%</p>
	<p>Academic report</p>	<p>90%</p>
<p>教材及參考資料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Zhang youlin. Introduction to Food Science. Beijing: Science Press, 2006. 2. Potter N N, Hotchkiss J H. Food science. Beijing: China Light Industry Press, 2001. 3. Yang changju. Introduction to Food Science. Beijing: Renmin University of China press, 1999. 4. http://epub.cnki.net/kns/default.htm: Review and study the academic literature related to the curriculum. 5. http://www.baidu.com:Access to food knowledge information. 6. http://www.cnfoodnet.com/:Refer to the food industry information. 	

Food sensory evaluation

课程基本信息 Course Information					
课程名称 Course Name	食品感官分析 Food sensory evaluation				
课程编码 Course Code	09520020	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	24	实验学时 Experiment Hours	8
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Food sensory evaluation which is an important professional course, is a discipline developed by collecting the knowledge of psychology, physiology, and statistics based on physical and chemical food analysis. It has been widely used in the development of new products, food quality evaluation, market guiding, and product recommendation. The course not only provides the practical, high sensitivity and reliable results, but also fixes the complex physiological feelings problems which cannot be easily solved by the general physical and chemical analysis.</p> <p>The course mainly includes the sensory evaluation method based on the basic principle, sample preparation methods, and application scope of different standard method and data processing method. Through learning this course, the students can master the general method of food sensory evaluation technique, and can design and develop all kinds of basic solution of food sensory evaluation.</p> <p>Prerequisite: The course is open to international students majoring in Food Science and Engineering.</p>				

<p>课程目标 Aims & Learning Objectives</p>	<ol style="list-style-type: none"> 1. Understand the concept and characteristics of food sensory evaluation, history, development prospects, and master the basic concepts. 2. Understand the characteristics, rules, threshold of feelings and five basic sensory organs, as well as the special physiological process developed by a variety of feelings. Master the significance of all kinds of feeling for food sensory evaluation, special psychological effect of food sensory evaluation. 3. Understand the selection, training and assessment of the staff in food sensory evaluation, the settings of the sensory assessment room, involved the subjective initiative and objective passive environment. Grasp some knowledge of mathematical statistics and analysis. 4. The students must understand the food sensory evaluation difference testing method and its application. They can choose the appropriate testing method according to the requirements of different sensory project, reasonable statistical analysis, and describe the evaluation result. 5. Understand the principle and application of description test methods. Master the jargon used by this method. Familiar with conversion of a variety of scale in description test method, master QDA figure and its meaning, and can profile description analysis of the sample according to the graph of the flavor. 6. Understand the main type, purpose and specific application of emotions inspection, master the principle, method and test result analysis method of referred sorting test, pleasure grading test and acceptance test. 7. Understand the application problems of sensory evaluation technology needed attention in the food industry. Sensory evaluation personnel should possess the ability and quality, and understand food sensory evaluation technology, which has important practical significance for food companies. Master basic sensory evaluation test method, and its rules and characteristics of practical application in food industry. 8. Understand the basic principle and method applied to sensory evaluation practice of the multipoint sensing technology, electromyography, palatine electric diagram, f-NIRS, gas chromatography - smell meter, electronic tongue and electronic nose. Master the core content of sensory evaluation of man-machine integration technology and its advantages.
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<p>教学内容 Topics</p>	<p>Chapter 1 Introduction to food sensory evaluation Teaching Content</p> <ol style="list-style-type: none"> 1. Concept, type and characteristics of food sensory evaluation 2. The difference between the sensory evaluation, and physical and chemical analysis 3. History of sensory evaluation 4. The development and prospect of sensory evaluation <p>Chapter 2 The foundation of food sensory evaluation Teaching Content</p> <ol style="list-style-type: none"> 1. The properties and basic discipline of food sensory 2. The five basic feeling and food inspection 3. The analysis of experimental psychology and special psychological effect. 4. The food sensory evaluation methods commonly used <p>Chapter 3 Food sensory evaluation criteria Teaching Content</p> <ol style="list-style-type: none"> 1. Food sensory evaluation rules and procedures 2. Selection and training of the stuff to food sensory evaluation 3. Environmental conditions of food sensory evaluation 4. Preparation and presented of samples in food sensory evaluation <p>Chapter 4 Food sensory evaluation method-discrimination test Teaching Content</p> <ol style="list-style-type: none"> 1. Overall difference test 2. Attribute difference test 3. Statistics analysis of difference test <p>Chapter 5 Food sensory evaluation method - description test Teaching Content</p> <ol style="list-style-type: none"> 1. Summary: Professional term to describe 2. Brief description analysis test 3. Quantitative description analysis test 4. Texture profile analysis test <p>Chapter 6 Food sensory evaluation method - emotion test Teaching Content</p> <ol style="list-style-type: none"> 1. Emotional inspection summary: functions and requirements 2. Emotional test method 3. Emotional test statistics analysis <p>Chapter 7 The application of food sensory evaluation technology Teaching Content</p> <ol style="list-style-type: none"> 1. Sensory quality control in food production
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	<p>2. The application of food sensory evaluation in the new food research and development</p> <p>Chapter 8 Sensory evaluation of man-machine integration technology</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Multipoint sensing technology 2. Electromyography 3. Palatal electrical diagram 4. Multimodal functional near infrared spectrum 5. Gas chromatography - the smelling meter 6. Electronic tongue and electronic nose 	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Attendance</p>	<p>10%</p>
	<p>Experiment</p>	<p>10%</p>
	<p>Final Exam</p>	<p>80%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Sensory Evaluation of Food: Principles and Practices (Food Science Text Series): 2nd ed, 2010, Auther: Harry T. Lawless. 2. Sensory Evaluation Practices (Food Science and Technology) : Third Edition, 2004, Auther: Herbert Stone. 3. Sensory Evaluation of Food: Principles and Practices, 1999, Auther: H. Heymann, Harry T. Lawless, 4. Laboratory Exercises for Sensory Evaluation (Food Science Text Series), 2013, Auther: Harry T. Lawless. 	

Biochemistry B

课程基本信息 Course Information					
课程名称 Course Name	生物化学 B Biochemistry B				
课程编码 Course Code	09520014	学分 Credits	4		
课内学时 Course Hours	64	理论学时 Lecture Hours	64	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>This course is intended for a one-semester course in Food Science and Engineering. Some prerequisites, such as organic chemistry or similar courses, are suggested for this course. Course will introduce basic knowledge and metabolism process of some essential materials, such as carbohydrate, lipid and protein. Biosynthesis of protein and nucleic acid is also presented. Moreover, related experiments, which are of 32 h approximately, are involved in this course.</p>				
课程目标 Learning Outcome	<p>This course is intended for a one-semester course. Some prerequisites, such as organic chemistry or similar courses, are suggested for this course. Course will introduce basic knowledge and metabolism process of some essential materials, such as carbohydrate, lipid and protein. Biosynthesis of protein and nucleic acid is also presented. Moreover, related experiments, which are of 32 h approximately, are involved in this course. This course is appropriate for students majoring in Food Science and Engineering.</p>				

<p>教学内容 Topic</p>	<ol style="list-style-type: none"> 1. Complex Numbers and Complex Variable Functions 2. Analytic functions 3. Integral of Complex Variable Function 4. Series 5. Remains 6. Fourier transform 7. Laplace transformation 8. Membrane Transport 9. Signaling 10. Carbohydrates 11. Metabolism and Bioenergetics 12. Glucose Metabolism 13. The Citric Acid Cycle 14. Oxidative Phosphorylation 15. Photosynthesis 16. Lipid Metabolism 17. Nitrogen Metabolism 18. Regulation of Mammalian Fuel Metabolism 19. DNA Replication and Repair 20. Transcription and RNA 21. Protein Synthesis
<p>考核方式 Grading</p>	<p>Final score is based on attendance for 10%, assignment homework and quiz for 10%, experiment for 20% and final exam for 60%.</p>
<p>教材及参考资料 Textbooks &Other Materials</p>	<p>1. Charlotte W. Pratt, Kathleen Cornely. Essential Biochemistry (Fourth Edition). USA: John Wiley and Sons, Inc. 2018.</p>

Microbiology

课程基本信息 Course Information					
课程名称 Course Name	微生物 Microbiology				
课程编码 Course Code	09520032	学分 Credits	3		
课内学时 Course Hours	48	理论学时 Lecture Hours	48	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Course Description:</p> <p>Microbiology is a compulsory course for students majoring in food science and engineering. The course is specifically designed to meet the needs of students interested in pursuing a career in food science and engineering.</p> <p>The course covers the history, classification, morphology, metabolism, genetics, ecology, pathogenicity, epidemiology, and social importance of microorganisms. Students will learn to identify and distinguish among different categories of microorganisms: bacteria and archaea, eukaryotic microbes, and viruses. The course will also concentrate on microbial diseases and on how the host immune system fights infection. Students will learn important principles of disease prevention and control. Students will develop laboratory skills that include: handling, staining, cultivating, isolating, quantifying, and identification of microbes.</p>				
课程目标 Aims & Learning Objectives	<ol style="list-style-type: none"> 1. Be able to describe the definition of microbiology and the relationship between microorganisms and human beings. Have an understanding of the phylogeny of microbiology, the function and the status of microbiology in the development of life science. 2. Be able to describe the diversity of prokaryotic microorganisms. Be familiar with the size, shape, structures, function and the reproduction of bacterial cells. 3. Be able to describe the diversity of Eukaryotic microorganisms. Be familiar with the size, shape, structures, function, the reproduction and the characteristic of colonies of yeast and filamentous fungi. Have an understanding of the 				

classification, structure, nutrition, reproduction of Algae and Protozoa.

4. Be familiar with the definition, general properties and classification of viruses. Be able to describe the life cycle of bacteriophages, plant viruses and animal viruses, the one-step growth curve and the definition of lysogeny.

5. Be able to describe the nutritional types of microorganisms. Be familiar with the common nutrient requirement, and the methods of designing a media of microorganisms.

6. Be familiar with the types and the characteristic of microbial metabolism, systematically learning the metabolic pathways of energy production, the biosynthesis of microorganisms.

7. Be able to describe the rules of microbial growth. Be familiar with the measurement of microbial growth, the influence of environmental factors on microbial growth and the control of microorganisms by physical and chemical agents.

8. Be able to describe the structure and function of genetic material, gene mutation and breeding by induced mutation. Be familiar with gene recombination, gene engineering and its application and the methods of preserving microbial cultures.

9. Be able to describe the microbial community in natural environments. Be familiar with interactions between microorganisms and biological environments and the physiological state of microorganisms in ecosystems.

10. Have an understanding of the relationship between the immunity of human being and pathogenic microorganisms. Be familiar with the definition and the applications of immunology.

11. Have an appreciation of the practice of microbiology. Be able to describe the taxa of biological classification, the nomenclature of microorganisms. Be familiar with the methods of microbial classification. Appreciate the Bergey' s Manual of Systematic Bacteriology and Ainsworth and Bisby' s Dictionary of Fungi.

<p>教学内容 Topics</p>	<p>Chapter 1 The History and Scope of Microbiology Teaching Content 1. Microbes around us 2. What are microbes 3. The microbes in human welfare 4. The history of microbiology 5. Modern microbiology 6. Microbiology development in China Chapter 2 Prokaryotic microorganisms Teaching Content 1. Prokaryotic cell structure and function 2. Bacteria and Archaea 3. Actinomycetes 4. Cyanobacteria 5. Mycoplasma, Rickettsia and Chlamydia Chapter 3 Eukaryotic microorganisms Teaching Content 1. Eukaryotic cell structure and function 2. Yeast 3. Filamentous fungi: Mould 4. Algae 5. Protozoa Chapter 4 Virus and Subvirus Teaching Content 1. General Properties of Viruses 2. The Structure of Viruses 3. Classification of Viruses 4. Viroid, Virusoid and Prion 5. The Life Cycle of Viruses Chapter 5 Microbial nutrition Teaching Content 1. The Common Nutrient Requirements 2. Nutritional types of microorganisms 3. Uptake of Nutrients by the Cell 4. Culture media Chapter 6 Microbial metabolism Teaching Content 1. Energy Release and Conservation 2. The Use of Energy in Biosynthesis Chapter 7 Microbial growth and control of microorganisms Teaching Content</p>
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	<p>1. Microbial Growth 2. The control of microbial growth Chapter 8 Microbial genetics Teaching Content 1. Definitions: Microbial genetics 2. Microbial Genomics 3. Microbial Plasmids 4. Mutation 5. Microbial Gene recombination 6. The preservation of microbial cultures Chapter 9 Microbial ecology Teaching Content 1. Microorganisms in the Soil Environments 2. Microorganisms in Aquatic Environments 3. The Utilization of Microbial Resources 4. Microorganism Interactions 5. Nutrient Cycling Interactions 6. Environmental Protection Chapter 10 Infection and Immunity Teaching Content 1. Infection 2. Non-specific immunity 3. Specific immunity 4. Medical Immunology Chapter 11 Microbial classification and identification Teaching Content 1. Levels of Classification 2. Theory of biological classification 3. Microbial Classification Systems 4. Methods used in microbial taxonomy</p>	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Final score based on attendance and assignment</p>	<p>20%</p>
	<p>Mid-term exam</p>	<p>10%</p>
	<p>Final exam</p>	<p>70%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>Ingraham, J. L., Ingraham, C. A. Introduction to Microbiology. Science Press, 2003.</p>	

Physical Properties of Foods A

课程基本信息 Course Information					
课程名称 Course Name	食品物理学 A Physical Properties of Foods A				
课程编码 Course Code	09520024	学分 Credits	2		
课内学时 Course Hours	32	理论学时 Lecture Hours	28	实验学时 Experiment Hours	4
		上机学时 Programming Hours		实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	This course is introduced that the physics properties and principle of food materials, and the test way of physics properties. The main concept, such as Basic Physics Properties of Foods, Rheological Mechanical Properties and Texture of Foods, Mechanical Properties of Food Granular Mixtures, Hydrodynamic Characteristics of Foods, Thermal Characteristics of Food and Water, Optical Characteristics of Foods and Color, Electrical Characteristics of Foods and others, needs to be studied. The knowledge and thinking of the students is widened, and the innovative thinking is inspired by this course teaching. It is possible for the students to apply the physics principle to the engineering and technology. The new equipment design, the new way, technology and principle of processing are created.				

<p>课程目标 Aims& Learning Objectives</p>	<p>Teaching Object</p> <ol style="list-style-type: none"> 1. To know basic concept of physical properties of foods 2. To master the main content of physical properties of foods 3. To understand affecting factors of physical properties of foods 4. To know the relationship between this course and other professional (foundation) course 5. To know the universality of the physical research, the application and role in the production processing. To understand the old saying “The beauty of the heaven and earth is judged, the physics of things all over the word”, “the science and physics all over the word cannot be ended”. To clear the learning objectives and requirements.
<p>教学内容 Topics</p>	<p>Chapter 1 Introduction</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Basic concept of physical properties of foods 2. Main content of physical properties of foods 3. Affecting factors of physical properties of foods 4. Status and role of physical properties of foods in professional culture system 5 Applications of physical properties of foods during the processing of production. <p>Chapter 2 Basic Physics Properties of Foods</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Basic concept, theory, and characterization of basic physics properties of foods 2. Principles and methods of measurement of the porosity 3. Applications of physical properties of foods during the engineering processing. <p>Chapter 3 Rheological Mechanical Properties and Texture of Foods</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Overview of rheological mechanical properties of foods 2. Theory of rheological mechanical properties of foods 3. Rheological properties of liquid foods 4. Concept and measurement of rheological properties of solid foods 5. Basic concept and evaluation methods of food texture 6. Application of rheological mechanical properties in the engineering area <p>Chapter 4 Mechanical Properties of Food Granular Mixtures</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Friction characteristics of granular mixtures 2. Adhesion and cohesion of granular mixtures 3. Deformation and shear strength of granular mixtures 4. Basic theory of granular flowing, formation of shattering arch, segregation and mixing, compression flowing, and their measurement 5. Pressure between vessel and granular mixtures, and explosion of dust 6. Application of mechanical properties of granular mixtures in the food engineering

	<p>area.</p> <p>Chapter 5 Hydrodynamic Characteristics of Foods</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Force and drag coefficient between fluid and materials, and their basic calculation 2. Critical speed of particles and its measurement method 3. Application of hydrodynamic characteristics of materials in the food engineering area <p>Chapter 6 Thermal Characteristics of Food and Water</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Heat transfer of foods and main parameters 2. Measurement methods of the main parameters of heat transfer 3. Application of thermal characteristics in the food engineering area <p>Chapter 7 Optical Characteristics of Foods and Color</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Basic concept of optical characteristics 2. Measurement principle and methods of optical characteristics of food 3. Color and its evaluation of foods 4.Characterization systems of food color 5. Measurement methods of food color 6. Application of optical and color characteristics of food <p>Chapter 8 Electrical Characteristics of Foods and others</p> <p>Teaching Content</p> <ol style="list-style-type: none"> 1. Basic concept of electrical characteristics of foods 2. Electromagnetic characteristics during food processing 3. Electrical characteristics of foods and its measurement 4. Other electrical, magnetic, acoustic properties 5. Application of electrical characteristics of foods 	
<p>考核方式</p> <p>Grading</p>	Evaluation	Percentage
	Final score based on attendance	15%
	Assignment homework	25%
	Final exam	60%
<p>教材及参考资料</p> <p>Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Li Lite. "Physical Properties of Foods", Beijing: Chinese Agricultural Press, 2001. 2. Li Yunfei, Yin Yongguang, Jin Wanhao. "Physical Properties of Foods", Beijing: China Light Industry Press, 2005. 3. CNKI (http://epub.cnki.net/kns/default.htm) 	

Practicum of Unit Operations of Food Engineering A

课程基本信息 Course Information					
课程名称 Course Name	食品工程原理课程设计 A Principles of Food Engineering Design A				
课程编码 Course Code	09561011	学分 Credits	2		
课内学时 Course Hours	45	理论学时 Lecture Hours	0	实验学时 Experiment Hours	45
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	This course is a core curriculum for undergraduate degree in food science and engineering. It provides the students with opportunities to gain problem-solving skills and with practice to application of engineering concepts of food processing.				
课程目标 Aims & Learning Objectives	<p>The aim of curriculum of "Practicum of Unit Operations of Food Engineering" is to comprehensively train students who have finished the curriculum of "Unit Operations of Food Engineering" using content of the distillation of alcohol and water appointed by teacher, so that students can master main content of theoretical teaching of fluid flow, heat transfer, and mass transfer.</p> <p>The task of the curriculum is: (1) to let student master the basic requirement , demonstration method of process and equipment selected, design approach, writing of design specification; (2) to culture students' ability of selecting and designing processes and equipment ,consulting data, analyzing and solving problems; (3) to let students understand the basic research methods and applying in engineering of the principle of" Unit Operations of Food Engineering"; (4) to give students the basic of designing and operating of the processes and equipment of food processing.</p>				

<p>教学内容 Topics</p>	<p>The basic content</p> <ol style="list-style-type: none"> 1. Select technology flow and draw the flow figure; 2. Select distillation scheme and demonstrate, include: the principle of selecting tower, pressure, feeding status, several feeding, heating method, model of heater over tower, cold agent and its temperature selecting of inlet or outlet, reflux ratio; 3. Technology calculation include material balance, pressure in tower, reflux ratio, theoretical plate number, real plate number, heat balance; 4. Plate design include tower technology design, plate technology design; 5. Auxiliary equipment design include selecting model design of heater and pump design
<p>考核方式 Grading</p>	<p>One 2h-paper at the end of practical work (60%); Practical work (40%).</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>The guiding book of the practicum of Unit Operations of Food Engineering (in Chinese), Liu Wei-min</p>

Principles of Food Engineering A

课程基本信息 Course Information					
课程名称 Course Name	食品工程原理 A Principles of Food Engineering A				
课程编码 Course Code	09520021	学分 Credits	4.5		
课内学时 Course Hours	72	理论学时 Lecture Hours	72	实验学时 Experiment Hours	12
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>This course is a core curriculum for undergraduate degree in food science and engineering. It presents an overview on the basic engineering principles of mass and energy balances, thermodynamics, fluid flow, and heat and mass transfer and the basic principles of food processing techniques, such as drying. The goal of this course is to provide students with necessary background in engineering concepts of food processing and set up their ability in the solution to practical problems.</p>				
课程目标 Aims & Learning Objectives	<ol style="list-style-type: none"> 1. Know the nature, task, research object and method of the course 2. Understand the basic concept and principle of the unit operation 3. Know the meaning why we need carry out the research on basic procedure of food engineering 4. Know the dimension and unit of physical magnitude existed in food engineering 5. Know the difference or the relationship of unit operation between chemical engineering and food engineering 				

<p>教学内容 Topics</p>	<p>Teaching Content Chapter 1 Introduction Chapter 2 Fluid Flow in Food Processing Chapter 3 Supplemental Processes Chapter 4 Heat Transfer in Food Processing Chapter 5 Preservation Processes Chapter 6 Refrigeration and Food Freezing Chapter 7 Evaporation Chapter 8 Mass Transfer Chapter 9 Membrane Separation Chapter 10 Dehydration</p>	
<p>考核方式 Grading</p>	<p>Evaluation</p>	
	<p>Final score is based on reading and discussion</p>	<p>Percentage 20%</p>
	<p>Assignment homework and quiz</p>	<p>20%</p>
	<p>Midterm exam</p>	<p>10%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<p>Final exam 50%</p>	
	<p>R. Paul Singh, Dennis R. Heldman. Introduction to Food Engineering (Fifth Edition), Academic Press, 2013</p>	

Food Chemistry

课程基本信息 Course Information					
课程名称 Course Name	食品化学 Food Chemistry				
课程编码 Course Code	09520023	学分 Credits	3		
课内学时 Course Hours	48	理论学时 Lecture Hours	48	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Food Chemistry is a core of professional basic courses for food science and engineering major. The main contents are divided by the main components in food materials including introduction, water and ice, carbohydrate, lipid, amino acid, peptide and protein, vitamin, minerals, enzyme, colorants, and flavor. The objectives of this course are to (1) introduce the definition, structure, properties and functions of the main components in food materials, (2) reveal the interactions between these components and changes of these components during food processing and storage, and (3) represent the effects of these reactions and changes on food quality. This course highlights the relationship between food component and food quality, which provides a broad theoretical basis for students who engage in the food processing, preservation and new product development.</p>				
课程目标 Aims & Learning Objectives	<ol style="list-style-type: none"> 1. Master the contents, direction and approaches of food chemistry, and understand its importance in the food industry. 2. Master the properties, existence forms and morphology of water and ice, definition of water activity, and its effect on food quality. 3. Master the structure, types, properties and changes in food processing and storage of carbohydrates, and their effects on food quality. 4. Master the structure, types, properties, and general methods of processing and storage of lipids. 5. Master the structure, properties and changes in food processing of amino acids, peptides, and proteins, and their effects on food quality. 6. Master the structure, properties, nutritional value, and general methods of processing and storage of vitamins. 				

	<p>7. Master the classification, properties, nutritional value, and changes in food processing and storage of minerals.</p> <p>8. Master the structure, characteristics, reaction conditions, and changes in food processing and storage of enzymes, and their effects on food quality.</p> <p>9. Master the classification, properties, functions, and changes in food processing and storage of enzymes, and their effects on food quality.</p> <p>10. Master the classification, properties, formation pathway, and regulation and control methods of flavors, and their effects on food quality.</p> <p>11. Master the classification, structure, properties, removal methods, and safety evaluation of food toxic substances</p>	
<p>教学内容 Topics</p>	<p>Contents</p> <ol style="list-style-type: none"> 1. Introduction to Food Chemistry 2. Water and Ice 3. Carbohydrates 4. Lipids 5. Amino Acids, Peptides, and Proteins 6. Vitamins 7. Minerals 8. Enzymes 9. Colorants 10. Flavors 11. Seminar 12. Test1-4 	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Final score is based on attendance</p>	<p>10%</p>
	<p>Test reports</p>	<p>20%</p>
	<p>Final reports</p>	<p>70%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Food Chemistry: 4th Edition, 2014, Author: Owen R. Fennema 2. Food Chemistry: 4th Edition, 2009, Author: Hans-Dieter Belitz and Werner Grosch. 3. Zella Isabel Perkins Egdah."An Elementary Course Of Food Chemistry", 2011.7. 4. Connie M. Weaver. "The Food Chemistry Laboratory: A Manual for Experimental Foods, Dietetics, and Food Scientists", 2nd Edition, 2003. 5. Dominic W.S. Wong. "Mechanism and Theory in Food Chemistry", 1989. 6. Dennis D. Miller. "Food Chemistry: A Laboratory Manual", 1998. 7. Frank Lee. "Basic Food Chemistry", 2012. 8. John M. deMan."Principles of Food Chemistry (Food Science Text Series)", 3rd Edition, 2013. 	

Food Processing Machinery and Equipment A

课程基本信息 Course Information					
课程名称 Course Name	食品加工机械与装备 A Food Processing Machinery and Equipment A				
课程编码 Course Code	05410034	学分 Credits	3		
课内学时 Course Hours	48	理论学时 Lecture Hours	48	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Food processing machinery and equipment is one of the core courses for students majoring in food science and engineering to learn and cultivate engineering knowledge. At the same time, it is also a professional course and key construction course for undergraduates of Jiangsu University. This course is a compulsory course for undergraduates majoring in food science and engineering, and an elective course for students majoring in food quality and safety. The purpose and task of this course is to teach the principle, structure and performance of all kinds of food processing machinery and equipment, the determination and selection of parameters, the application of automatic control, the selection and use of equipment, etc., in order to improve students' practical ability and innovation awareness, and cultivate students' engineering quality.</p>				

<p>课程目标 Aims & Learning Objectives</p>	<ol style="list-style-type: none"> 1. Understand the significance of learning the course, interested in Food Factory Machinery and Equipment, master the main methods of learning the course, understand the development status of food processing industry and food machinery industry, and master the classification methods of food machinery and equipment. 2. Understand the function of material conveying machinery and equipment in food factory. Master the working principle, main component structure and productivity calculation method of belt conveyor, bucket elevator and screw conveyor. Understand the working principle of conveying machinery and equipment such as vibration conveyor or pneumatic conveyor. Understand the working principle of various types of pumps (such as centrifugal pump, screw pump, gear pump, sliding vane pump, etc.). Master the working process and device process of conveying machinery and equipment such as flow through and vacuum suction device. 3. Understand the function of cleaning and cleaning machinery and equipment in food factory, and master the working principle of screening method cleaner, weeder, stone remover and iron remover. Master the working principle, technological process and productivity calculation method of the air blast cleaning and automatic bottle washing machine. Understand the working principle of tin plate empty can cleaning machine. 4. According to the different nature of impurities in food raw materials, choose different cleaning machinery, master the working principle of cleaning machinery such as screening method; in order to ensure food hygiene, remove impurities and dirt in food raw materials, containers of packaged food, equipment surfaces and pipes in contact with food, etc. all realize automatic production through cleaning machinery and equipment. On the basis of understanding cleaning and clearing machinery and equipment, have the comprehensive application ability of food cleaning and clearing machinery and equipment. 5. Knowledge aspect: Understand the main functions of food sorting and classification machinery, the commonly used sorting and classification methods of food, master the working principle of swing screen and roller screen, and the calculation method of productivity. Understand the interaction between light and food materials in the photoelectric sorting and grading machinery and equipment, the application technology of light characteristics of food materials and the characteristics of application technology of light characteristics of food materials, the working principle of photoelectric sorting machine and color sorting machine. Master the application of new technology and method in the classification and separation machine.
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<p>教学内容 Topics</p>	<p>Chapter 1 Introduction</p> <p>The position of Food Factory Machinery and Equipment in all courses of food science and engineering, food machinery and automation, and the significance of learning the course; outline the main contents of the course and the methods of learning the course; understand the development status of food processing industry and food machinery industry; characteristics and classification of food machinery and equipment.</p> <p>Chapter 2 Material conveying machinery and equipment</p> <p>The function of material conveying machinery and equipment in food factory, the working principle of belt conveyor, bucket elevator and screw conveyor, and the calculation method of productivity of main components; working principle of vibrating conveyor, pneumatic conveyor and other conveying machinery and equipment; working principle of various types of pumps (such as centrifugal pump, screw pump, gear pump, sliding vane pump, etc.); working process and device flow of conveying machinery and equipment such as flow trough and vacuum suction device.</p> <p>Chapter 3 Cleaning and clearing machinery and equipment</p> <p>The function of cleaning and clearing machinery and equipment in food factory, and the working principle of screening cleaning machine, weeding machine, stone remover and iron remover in cleaning machinery and equipment ; the working principle, production process and productivity calculation method of the air blast cleaning and full-automatic bottle washing machine in the cleaning machinery and equipment, and the working principle of the drum type cleaning machine and the tinsplate empty tank cleaning machine ; CIP device of equipment surface, pipeline cleaning machinery and equipment in contact with food.</p> <p>Chapter 4 Sorting and grading machinery and equipment</p> <p>The main functions of the food sorting and classification machinery, the commonly used sorting and classification methods for food, the basic knowledge of the screening machinery, the types and structures of the screen surface, the transmission mode of the swing screen and the roller classification screen, the working principle of the swing screen and the calculation method of the productivity ; three roller classifier, belt classifier, roller cleaner and disc cleaner in shape grading machinery and equipment ; the interaction between light and food materials in the photoelectric separation and classification machinery and equipment, the application technology of light characteristics of food materials and the characteristics of application technology of light characteristics of food materials, the working principle of photoelectric separation machine and color separation machine ; the classification principle and application of image processing, near infrared spectroscopy and electronic nose detection in agricultural products and food.</p> <p>Chapter 5 Separation machinery and equipment</p>
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Centrifugal separation principle and equipment classification; the structure, principle and use specification of disc centrifuge separation equipment, horizontal spiral centrifuge and tripod centrifuge; the principle and structure of the machinery and equipment for liquid separation; the principle and characteristics of filtering machinery and equipment; the structure, working principle and application of plate and frame filter press; the principle of reverse osmosis, ultrafiltration and ion exchange; the characteristics, structure and application of membrane separation equipment ; the principle, characteristics, structure and application of supercritical extraction equipment; the principle of molecular distillation and structure of device.

Chapter 6 Crushing machinery and equipment

Classification of crushing methods and machines; hammer, roller, air flow and vibration crushing machines and applications in dry crushing machines and equipment; high-pressure homogenizer equipment and applications in wet crushing machines and equipment as well as colloid mill and other pulping equipment; main components, structure and working process of fruit and vegetable pulper in fruit and vegetable crushing machines and equipment, structure and work of screw crusher The principle and method of orientation of raw materials in the production process, mushroom directional slicer and green bean cutter; the structure and working process of programmable meat grinder and super bone paste machine in the meat grinder and crushing machinery and equipment; the working principle and structure of fine grinding, planetary grinding and biconical grinding in the ultra-fine grinding machinery and equipment.

Chapter 7 Mixing machinery and equipment

Basic concept of mixing and classification of common mixing machines; structure, type and working process of liquid mixing machine. The structure, type and working process of liquid mixing machine. The structure, working principle and use of eggs beater; the working principle and main structure of horizontal screw belt mixer, horizontal paddle mixer, vertical auger mixer and planetary auger mixer in solid mixing machinery and equipment. Working principle and application situation of rotating container mixer; the working process of kneader and mixing pot in solid-liquid mixing machinery and equipment; the working principle and application of jet, spray and film carbonator in gas-liquid mixing machinery and equipment.

Chapter 8 Concentration and drying machinery and equipment

In order to reduce the moisture content of food materials, it is necessary to remove the moisture from the materials. In this chapter, according to the initial moisture content, state (solid, liquid), nature (viscosity, particle size), sensitive components and other factors of materials, key points explains common food concentration, drying methods and corresponding concentration, drying equipment. Understand the operation process of vacuum concentration device. Master the central circulation tube (standard) thickener and plate type thickener, understand the coil type, jacket heating room and other thickening equipment, and understand the rising film type, falling film type, scraper type and centrifugal type thickening

	<p>equipment. Understand the accessory equipment of vacuum concentration device. Master the basic principle and main component structure of spray drying, the characteristics of pressure spray drying and centrifugal drying. Understand the spray drying equipment process and typical device. Understand the main principles and characteristics of other drying methods.</p> <p>Chapter 9 Sterilization machinery and equipment</p> <p>There are lots of nutrients in food. The reproduction of microorganisms in food not only consumes the nutrients, but also produces harmful metabolites. Therefore, sterilization is an important part of food processing. This chapter focuses on the working principle and structural composition of food sterilization machinery and equipment from the perspective of heating mode (direct, indirect), sterilization pressure (atmospheric pressure, high pressure) and operation mode (continuous, discontinuous) of food materials, and introduces the latest international sterilization technology and equipment to students.</p> <p>Chapter 10 Packaging machinery and equipment</p> <p>Food must be packed properly for storage, circulation and consumption. Therefore, the key points in this chapter are to master the charging method, basic structure and working principle of the liquid filling machine in the sub loading machine; the basic structure and working principle of thick sauce filling machine; as well as the working principle and structure of the solid charging machine with constant volume and weighing, such as cuvette type, rotary drum type, plunger type and screw extrusion type; understand the working principle and structure of vertical and horizontal bag making and filling packaging machine and vacuum gas filling packaging machine in the bag sealing machine.</p>	
<p>考核方式 Grading</p>	Evaluation	Percentage
	Final score based on classroom performance accounts	10%
	Course assignments accounts	10%
	Experiment item accounts	20%
	Examination accounts	60%
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. Food Processing Machinery and Equipment, Chen Bin, Mechanical Engineering Press, 2012, 2nd Edition. 2. Food machinery and equipment, Ma Haile, Beijing: China Agriculture Press, 2012, 2nd Edition. 3. Food Processing Machinery and Equipment, Edited by Chen Bin, Beijing: Mechanical Engineering Press, 2012, 2nd Edition. 4. Food Machinery and Equipment, Edited by Ma Haile, Beijing: China Agriculture Press, 2012, 2nd Edition. 5. Food Machinery and Equipment. Edited by Yin Yongguang, Beijing: Chemical Industry Press, 2007. 	

Food Processing Technology A

课程基本信息 Course Information					
课程名称 Course Name	食品加工工艺学 Food Processing Technology				
课程编码 Course Code	09530026	学分 Credits	5		
课内学时 Course Hours	80	理论学时 Lecture Hours	80	实验学时 Experiment Hours	0
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Food processing technology is a major professional basic course of food science and engineering, which is a compulsory course. Its main content is based on the courses of food chemistry, microbiology, food nutrition, food processing machinery and equipment, focusing on the basic principles, processing technology, product quality control and other theoretical knowledge of fine and deep processing of fruits and vegetables, grain and oil, animal products to make students understand the essence of modern food industry, master the ability to complete the design of process and product formula, and analyze the key control points of process; to find problems from the existing process, analyze the problems, and propose solutions; Understand the comprehensive utilization of food resources The theoretical frontier and development trends lay a solid theoretical foundation for its future work in food processing related industries.</p>				
课程目标 Aims & Learning Objectives	<p>1. Enable students to understand the nature of food industry, grasp the basic concepts related to food industry, understand the current situation of food industry in China and the world, clarify the purpose and significance of food processing, and be familiar with the main research scope of this course.</p> <p>2. Master the basic method of learning this course.</p>				

<p>教学内容 Topics</p>	<p>Chapter 1 introduction The concept of food processing; the purpose and significance of food processing; the status and Prospect of food industry; the main research scope of introduction to food technology.</p> <p>Chapter 2 Dehydroation The principle of food dry storage, concept of water activity, influencing factors of water activity; basic process of food drying; influence of drying on food quality; drying method of food; packaging and storage of dried products; processing technology of dried products.</p> <p>Chapter 3 Refrigeration and freezing The basic principles of food frozen storage; refrigeration technology and equipment of food; frozen storage technology and equipment of food; thawing of frozen storage products.</p> <p>Chapter 4 Canning The concept and basic principle of canning; canning technology; spoilage of canning food.</p> <p>Chapter 5 Irradiation The concept and principle of irradiation preservation; irradiation technology and application; inspection of irradiation products.</p> <p>Chapter 6 Pickling and Roasting The basic principles of food pickling; food pickling process; components of smoking; smoking process.</p> <p>Chapter 7 Chemical preservation The concept and principle of chemical preservation; food preservatives; food antioxidants.</p> <p>Chapter 8 Principle and pretreatment of processing and preservation of fruits and vegetables The chemical composition and processing of fruits and vegetables; methods of food spoilage and preservation; requirements and pretreatment of raw materials for fruits and vegetables processing.</p> <p>2. Ability and quality: according to different characteristics of fruit and vegetable raw materials, design and choose the best processing pretreatment method.</p> <p>Chapter 9 Fruit and vegetable juices First of all, we should establish the product design principles and concepts of fruit and vegetable juice; understand the basic ingredients, resource distribution, industrial status and market of raw materials of fruit and vegetable varieties; be familiar with the processing process, basic equipment and key equipment, production technology and product standards of fruit and vegetable juice; deeply understand the latest processing technology and market dynamics of hand-held fruit and vegetable juice.</p> <p>Chapter 10 Rice and flour making</p>
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	<p>The technological quality of rice; rice processing technology; comprehensive utilization of rice by-products; wheat technological quality; wheat cleaning process; wheat milling technology; flour product processing; production process characteristics of grade and special flour.</p> <p>Chapter 11 Processing and refining of vegetable oil</p> <p>The types and technological properties of plant oil; preparation of plant oil; utilization of by-products of plant oil processing; refining of plant oil.</p> <p>Chapter 12 Production of plant protein and processing of soybean protein products.</p> <p>The basic characteristics of plant protein; types and properties of plant protein; production of typical plant protein; structure and composition of soybean; production of traditional soybean products; comprehensive utilization of soybean processing by-products.</p> <p>Chapter 13 Starch processing</p> <p>The extraction of different starch; comprehensive utilization of by-products in starch plant.</p> <p>Chapter 14 Dairy processing technology</p> <p>Understand the concept and acceptance of milk; be familiar with the processing methods and principles of standardization, sterilization, concentration, drying and other processing technologies in dairy production.</p> <p>Chapter 15 Meat processing technology</p> <p>The structure and chemical composition of meat; low temperature storage; fresh meat-controlled atmosphere storage; raw meat radiation storage; the development history and trend of meat products.</p>	
<p>考核方式 Grading</p>	<p>Evaluation</p>	<p>Percentage</p>
	<p>Final score based on attendance</p>	<p>10%</p>
	<p>Experiment</p>	<p>10%</p>
	<p>School assignments (four times)</p>	<p>10%</p>
	<p>Final exam</p>	<p>70%</p>
<p>教材及参考资料 Textbooks & Other Materials</p>	<ol style="list-style-type: none"> 1. (Woodhead Publishing in Food Science and Technology) Peter J. Fellows - Food Processing Technology_ Principles and Practice 2. J. Scott Smith, Yiu H. Hui - Food processing_ principles and applications (2004, Wiley-Blackwell). 3. Ramesh C. Chandan, Arun Kilara - Dairy Ingredients for Food Processing (2011, Wiley-Blackwell). 4. (Food science and technology 158) Leo M.L. Nollet, Fidel Toldra - Advanced Technologies For Meat Processing-CRC_Taylor & Francis. 5. Jingdun Jia, Donghong Liu, Haile Ma. Advances in Food Processing Technology. 	

Curriculum Design of Food Factory Design

课程基本信息 Course Information					
课程名称 Course Name	食品工厂设计课程设计 Food Factory Course Design				
课程编码 Course Code	09561010	学分 Credits	2		
课内学时 Course Hours	24	理论学时 Lecture Hours	0	实验学时 Experiment Hours	24
		上机学时 Programming Hours	0	实践学时 Practice Hours	0
课外学时 Home Hours	0				
授课语言 Language of Instruction	中文 Chinese				
课程简介 Course Description	<p>Curriculum Design of Food Factory Design is one of the most important professional practical courses for food science and engineering major. In this course the simulated practice to design a food factory will be achieved. Students need to gather all the necessary information themselves for designing a food factory with a specific topic. The outline includes address selection of factory, selection of technology for food production, material balance, selection of equipment and equipment arrangement, drawing and economic assessment, etc. This course helps to improve the ability of student to be an engineer.</p>				
课程目标 Aims & Learning Objectives	<p>Design topic assignment and information searching for food factory design</p> <ol style="list-style-type: none"> 1. Know the background of food and the potential economic performance 2. Understand the Chinese basic construction procedure Location selection <ol style="list-style-type: none"> 1. Learn how to select the optimum address for the factory 2. Understand Chinese procedure of location selection 3. Understand how to write the report of location selection General layout of food factory and drawing <ol style="list-style-type: none"> 1. Learn layout of the factory 2. Know how to arrange the buildings and structures of food factory 3. Know how to arrange the transport for the factory 4. Master the drawing skill of general graphic design Selection of production technology, material balance and drawing of 				

	<p>process flow sheet</p> <ol style="list-style-type: none"> 1. Master the selection of technology for a specific food and optimize the technology 2. Master the calculation of the production technology according the assignment. 3. Master to draw the process flow sheet for production technology <p>Equipment selection and arrangement</p> <ol style="list-style-type: none"> 1. Master the skills for selection of equipment for the food production. 2. Master the skills for drawing the general layout of the manufacturing workshop <p>Economic evaluation</p> <ol style="list-style-type: none"> 1. Understand the importance of economic performance for food production. 2. Master to analysis the parameters influencing the economic performance.
<p>教学内容 Topics</p>	<p>Design topic assignment and information searching for food factory design</p> <ol style="list-style-type: none"> 1. Basic construction procedure 2. Proposals for the projects 3. Feasibility study 4. Background of food and promising of sales <p>Location selection</p> <ol style="list-style-type: none"> 1. Analysis of the property of different address 2. Select one address for the factory and give the reasons 3. Give the general graph of the factory and drawing 4. Writing the corresponding report <p>General layout of food factory and drawing</p> <ol style="list-style-type: none"> 1. Design and arrange the factory 2. Design the transport in the factory 3. Draw the general graph <p>Selection of production technology, material balance and drawing of process flow sheet</p> <ol style="list-style-type: none"> 1. Select the technology for food production 2. Draw the preliminary graph of the production technology 3. Calculate the material balance of each step of production technology 4. Draw the process flow sheet <p>Equipment selection and arrangement</p> <ol style="list-style-type: none"> 1. Determine the flux of material of each step 2. Select the optimum equipment for each step and give their information 3. Arrange all the equipment in the manufacturing workshop 4. Draw the layout of equipment in the manufacturing workshop <p>Economic evaluation</p> <ol style="list-style-type: none"> 1. Calculate the input and output of the whole production technology 2. Analysis the performance of the production technology

<p>考核方式 Grading</p>	<p>Final score will be given based on the final report.</p>
<p>教材及參考資料 Textbooks &Other Materials</p>	<ol style="list-style-type: none"> 1. Zhang Guonong. Food factory design and environment protection. Beijing: China Light Industry Press, 2015. 2. Wang Weijian. Food factory design. Beijing: China Light Industry Press, 2014. 3. He Dongping. Food factory design. Beijing: China Light Industry Press, 2010. 4. Fang Ligu. Computer aided chemical drawing and design. Chemical Industry Press, 2010