# Curriculum Schedule for B.S. in Pharmaceutics Program of Jiangsu University

| Code No. | Course name | Term | Credits | Total hours | Hours/ week | Theory hours | Practice hours | Required or elective |
|---|---|---|---|---|---|---|---|---|
| A0101 | Chinese (I)<br>汉语 (I) | 1 | 5 | 75 | 5 | 75 | 0 | Required |
| A0102 | Chinese (II)<br>汉语 (II) | 2 | 5 | 75 | 5 | 75 | 0 | Required |
| A0103 | Chinese (III)<br>汉语 (III) | 3 | 5 | 75 | 5 | 75 | 0 | Required |
| A0104 | Chinese (Ⅳ)<br>汉语 (Ⅳ) | 4 | 5 | 75 | 5 | 75 | 0 | Required |
| A0200 | HSK Test<br>汉语水平考试 | 5 | 2 | 30 | 2 | 30 | 0 | Required |
| A0301 | Pharmaceutical Chinese (I)<br>药学汉语 (I) | 6 | 4 | 60 | 4 | 60 | 0 | Elective |
| A0302 | Pharmaceutical Chinese (II)<br>药学汉语 (II) | 7 | 4 | 60 | 4 | 60 | 0 | Elective |
| Code No. | Course name | Term | Credits | Total hours | Hours/ week | Theory hours | Practice hours | Required or elective |
| 01210241 | Medical Advanced Mathematics (A)<br>高等数学(医学类)A | 1 | 5 | 75 | 5 | 75 | 0 | Required |
| 06210090 | Basic of computer culture<br>计算机文化基础 | 1 | 2 | 30 | 2 | 20 | 10 | Required |
| 13210122 | Inorganic Chemistry (B)<br>无机化学(医学类)B | 4 | 4 | 60 | 4 | 40 | 20 | Required |
| 30210010 | Physical Education (I)<br>体育(I) | 1 | 2 | 30 | 2 | 30 | 0 | Required |
| 06210060 | Computer Programming (VFP)<br>程序设计(VFP) | 2 | 6 | 90 | 6 | 60 | 30 | Required |
| 13210271 | Organic Chemistry (A)<br>有机化学 A | 2 | 6 | 90 | 6 | 60 | 30 | Required |
| 30210020 | Physical Education (II)<br>体育(II) | 2 | 2 | 30 | 2 | 30 | 0 | Elective |
| 01210251 | College Physics (B)<br>大学物理(医学类)B | 3 | 3 | 45 | 3 | 45 | 0 | Required |
| 01210280 | Experiment of College Physics (B)<br>大学物理实验(医学类)B | 3 | 1.5 | 22 | 2 | 0 | 22 | Required |
| 30210030 | Physical Education (III) | 3 | 2 | 30 | 2 | 30 | 0 | Elective |

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| | 体育(III) | | | | | | | |
| 30210040 | Physical Education (IV)<br>体育(IV) | 4 | 2 | 30 | 2 | 30 | 0 | Elective |
| 31210010 | Literature Retrieval<br>文献检索 | 4 | 1 | 15 | 1 | 11 | 4 | Required |
| 14211180 | Anatomical Physiology<br>解剖生理学 | 1 | 4 | 60 | 5 | 60 | 0 | Required |
| 14211190 | Experiment of Anatomical Physiology<br>解剖生理学实验 | 1 | 1.5 | 20 | 2 | 0 | 20 | Required |
| 14270423 | Cellular Biology (C)<br>细胞生物学 C | 1 | 1 | 15 | 2 | 15 | 0 | Required |
| 13210011 | Analytical Chemistry (A)<br>分析化学 A | 2 | 7 | 105 | 7 | 60 | 45 | Required |
| 13210073 | Physical Chemistry (C)<br>物理化学 C | 3 | 4 | 60 | 4 | 45 | 15 | Required |
| 14211300 | Medical Statistics<br>数理统计(医药) | 3 | 3 | 45 | 3 | 45 | 0 | Required |
| 15211051 | Biochemistry (A)<br>医用生物化学 A | 3 | 6 | 90 | 6 | 60 | 30 | Required |
| 14211052 | Pathophysiology (B)<br>病理生理学 B | 4 | 3 | 45 | 3 | 30 | 15 | Required |
| Code No. | Course name | Term | Credits | Total hours | Hours/ week | Theory hours | Practice hours | Required or elective |
| 15211171 | Microbiology (A)<br>微生物学 A | 4 | 2.5 | 35 | 3 | 35 | 0 | Required |
| 15211182 | Immunology (B)<br>免疫学 B | 4 | 1.5 | 25 | 2 | 25 | 0 | Required |
| 16272300 | Pharmaceutical Molecular Biology<br>药学分子生物学 | 4 | 2 | 30 | 2 | 30 | 0 | Required |
| 15211160 | Experiment of Pharmaceutical Molecular Biology<br>药学分子生物学实验 | 4 | 1 | 15 | 1 | 0 | 15 | Required |
| 14211062 | Pharmacology (B)<br>药理学 B | 5 | 4 | 60 | 4 | 60 | 0 | Required |
| 14211350 | Experiment of Pharmacology<br>药理学实验 | 5 | 2 | 30 | 2 | 0 | 30 | Required |
| 16211030 | Pharmaceutical Analysis<br>药物分析 | 5 | 4 | 60 | 4 | 60 | 0 | Required |
| 16211040 | Experiment of Pharmaceutical Analysis<br>药物分析实验 | 5 | 3 | 45 | 3 | 0 | 45 | Required |
| 16211050 | Medicinal Chemistry<br>药物化学 | 5 | 3 | 45 | 3 | 45 | 0 | Required |

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|---|---|---|---|---|---|---|---|---|
| 16211060 | Experiment of Medicinal Chemistry<br>药物化学实验 | 5 | 3 | 45 | 3 | 0 | 45 | Required |
| 16211012 | Medicinal Chemistry of Natural Products (B)<br>天然药物化学 B | 6 | 3 | 45 | 3 | 45 | 0 | Required |
| 16211020 | Experiment of Medicinal Chemistry of Natural Products<br>天然药物化学实验 | 6 | 3 | 45 | 3 | 0 | 45 | Required |
| 16272210 | Pharmacognosy<br>生药学 | 6 | 3 | 45 | 3 | 45 | 0 | Required |
| 16210140 | Experiment of Pharmacognosy<br>生药学实验 | 6 | 2 | 30 | 2 | 0 | 30 | Required |
| 01210230 | Linear Algebra<br>线性代数 | 4 | 2 | 30 | 4 | 30 | 0 | Elective |
| 03210072 | Chemical Engineering Cartography B<br>化工制图 B | 4 | 2 | 30 | 2 | 28 | 2 | Elective |
| 06210010 | Foundations of Computer Application<br>计算机应用基础 | 4 | 2 | 30 | 2 | 15 | 15 | Elective |
| 14211024 | Histology and Embryology D<br>组织胚胎学 D | 4 | 1 | 15 | 1 | 15 | 0 | Elective |
| 14270060 | Laboratory Animal Science<br>实验动物学 | 4 | 1 | 15 | 1 | 12 | 3 | Elective |
| Code No. | Course name | Term | Credits | Total hours | Hours/ week | Theory hours | Practice hours | Required or elective |
| 15270100 | Parasitology<br>寄生虫学 | 4 | 1 | 15 | 1 | 15 | 0 | Elective |
| 16210150 | Physical Pharmacy<br>物理药学 | 4 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16272290 | Stereochemistry<br>立体化学 | 4 | 2 | 30 | 2 | 30 | 0 | Elective |
| 14270490 | Introduction to Traditional Chinese Medicine<br>中医学概论 | 5 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16270230 | Traditional Chinese Medicine Resource Science<br>中药资源学 | 5 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16272200 | Chinese Materia Medica<br>中药学 | 5 | 2 | 30 | 2 | 30 | 0 | Elective |
| 13211073 | Chemical Engineering Principle<br>化工原理 | 5 | 2 | 30 | 2 | 30 | 0 | Required |
| 13211112 | Chemical Engineering Principle Experiment B<br>化工原理实验 B | 5 | 1 | 15 | 1 | 0 | 15 | Required |

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| 16210071 | Industrial Pharmacy A(I)<br>工业药剂学 A(I) | 6 | 3 | 45 | 3 | 45 | 0 | Required |
| 16210320 | Industrial Pharmacy Experiment (I)<br>工业药剂学实验(I) | 6 | 2 | 30 | 2 | 0 | 30 | Required |
| 16210250 | Preparation Equipment and Process Design Workshop<br>制剂设备与车间工艺设计 | 6 | 2 | 30 | 2 | 30 | 0 | Required |
| 16270030 | Biopharmaceutical Analysis<br>体内药物分析 | 6 | 2 | 30 | 2 | 30 | 0 | Required |
| 16270020 | Biopharmaceutical Analysis Experiments<br>体内药物分析实验 | 6 | 2 | 30 | 2 | 0 | 30 | Required |
| 16210081 | Industrial Pharmacy A(II)<br>工业药剂学 A(II) | 7 | 2 | 30 | 2 | 30 | 0 | Required |
| 16210330 | Industrial Pharmacy Experiment (II)<br>工业药剂学实验(II) | 7 | 1 | 15 | 1 | 0 | 15 | Required |
| 16270010 | Biopharmaceutics and pharmacokinetics<br>生物药剂学与药物动力学 | 7 | 2 | 30 | 2 | 30 | 0 | Required |
| 16270060 | Biopharmaceutics and Pharmacokinetics Experiments<br>生物药剂学与药物动力学实验 | 7 | 2 | 30 | 2 | 0 | 30 | Required |
| 16270040 | Selected topics in modern pharmaceutics<br>现代药剂学导论 | 7 | 1 | 15 | 1 | 15 | 0 | Required |
| Code No. | Course name | Term | Credits | Total hours | Hours/ week | Theory hours | Practice hours | Required or elective |
| 16270130 | Pharmacy Administration and Statute<br>药事管理与法规 | 7 | 2 | 30 | 2 | 30 | 0 | Required |
| 16270170 | Pharmaceutical Polymers<br>药用高分子材料学 | 7 | 2 | 30 | 2 | 30 | 0 | Required |
| 16210220 | Pharmaceutical Polymers Experiments<br>药用高分子材料学实验 | 7 | 1 | 15 | 1 | 0 | 15 | Required |
| 16270000 | Formulas of Chinese Medicine<br>方剂学 | 6 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16270190 | Science of Processing Chinese Materia medica<br>中药炮制学 | 6 | 1 | 15 | 1 | 15 | 0 | Elective |
| 15270940 | Pharmacology of Chinese Materia Medica<br>中药药理学 | 7 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16270200 | Pharmacy of Chinese Materia Medica<br>中药药剂学 | 7 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16210310 | Tissue Engineering<br>组织工程学 | 6 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16272240 | Biological Products and Technology | 6 | 2 | 30 | 2 | 30 | 0 | Elective |

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| | 生物制剂工艺 | | | | | | | |
| 16210120 | The Formulation Research for the Biomacromolecule<br>生物大分子制剂研究 | 7 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16210230 | Vaccinology<br>疫苗学 | 7 | 1 | 15 | 1 | 15 | 0 | Elective |
| 16210180 | Pharmaceutical Synthesis Reactions<br>药物合成反应 | 6 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16270050 | Drug Research and Development<br>新药研究与开发 | 6 | 1 | 15 | 1 | 15 | 0 | Elective |
| 16270250 | Pharmaceutical Marketing<br>药品营销 | 6 | 1 | 15 | 1 | 15 | 0 | Elective |
| 16272270 | Bioengineering<br>生物工程 | 6 | 2 | 30 | 2 | 30 | 0 | Elective |
| 16210130 | Microencapsulated for the Bioactive Substances and Research Progress<br>生物活性物质的微囊化及其研究进展 | 7 | 1 | 15 | 1 | 15 | 0 | Elective |
| 16210190 | Pharmacoeconomics<br>药物经济学 | 7 | 2 | 30 | 2 | 30 | 0 | Elective |



## Practice education

| Code No. | Course name | Term | Credits | Weeks | Required or elective |
|---|---|---|---|---|---|
| 16260010 | Hospitals and Plant Practice<br>医院和工厂见习 | 5 | 1 | 1 | Required |
| 16260040 | Collection in the Field of Chinese Medicine<br>野外采集 | 6 | 1 | 1 | Required |
| 16260260 | Comprehensive Experiments in Pharmaceuticals<br>药学综合实验 | 7 | 2 | 2 | Required |
| 16260020 | Comprehensive Experiments in Chinese Traditional Medicine<br>中药学综合实验 | 7 | 2 | 2 | Required |
| 16260100 | Graduation Practice (dissertation)<br>毕业实习（论文） | 8 | 16 | 16 | Required |

**Course Description:**

**01210241 Medical Advanced Mathematics (A) 5 credits**

The basic knowledge such as calculus, ordinary differential equation, probability theory and linear algebra are introduced for the students to learn how to use the mathematical method to deal with medical problems

**06210090 Fundamentals of Computer Literacy 2 credits**

This course is for non-computer majors. This course enables students to learn the basic knowledge and to master operating system, word processing, excel spreadsheet, powerpoint presentations, internet technologies and computer security.

**10220010 Outline of Chinese Modern and Contemporary History 2 credits**

This course mainly introduces in contemporary history (from 1840 until now) how Chinese resisted the external aggression, strived for national independence and realized liberation. The students are required to comprehend the great changes in modern society, to set up a correct conception of history, and to obtain the ability to analyze historical events and comment on historical figures objectively.



**13210122 Inorganic Chemistry (B) 4 credits**

This course is to study the basic principle and knowledge of inorganic chemistry such as periodic law of elements, characteristic of molecular structure, valence-bond theory, oxidation-reduction reaction, acidity and alkaline of compounds, coordination compounds, chemical thermodynamics. The students are required to understand the relationship between chemical composition, molecular structure and the properties of the material under the guidance of basic principles

**17210010 College English (I) 5 credits**

This course is compulsory for non-English majors. Its contents include intensive reading, extensive reading, grammar, listening, writing, etc. The purpose of this

course is to enhance the comprehensive English skills of the students. College students are expected to arrive at CET-1 in terms of English proficiency level after completing this course.

**30210010 Physical Education (I) 2 credits**

This course is compulsory for all the students. It introduces the principles and methods of exercise and enables every student to master several kinds of sports skills as their own interests. The purpose is to help the students to exercise in a scientific way.

**06210060 Computer Programming (VFP) 6 credits**

This course is compulsory for the students of non-computer majors. The students are required to learn about computer programming methods, to be capable of writing VFP program independently with the database operation functions for information management.



**10210040 Ideological & Moral Cultivation and Fundamentals of Law 3 credits**

This course is to Marxism-Leninism, Mao Zedong Thought, Deng Xiaoping Theory and "Three Represents" as guidance, outlook on life, values, ethics education, the main line, educate and guide students to strengthen their own ideological and moral cultivation and improve ideological and moral quality of an ideological and political education programs. Contents: meet the goal of college life and establish a talent; good psychological quality; correctly deal with friendship and love; establish a correct outlook on life and values; cultivate good moral character; carry forward the national spirit; efforts to achieve comprehensive human development.

**13210271 Organic Chemistry (A) 6 credits**

Introduce the basic properties, sources and synthesis of organic compounds as well as the principles and the applications of organic chemistry.

**17210020 College English (II) 5 credits**

This course is designed for non-English majors. Its contents include intensive reading, extensive reading, grammar, listening, writing, etc. The purpose of this course is to enhance the comprehensive English skills of the students. College students are expected to arrive at CET-2 in terms of English proficiency level after completing this course.

**30210020 Physical Education (II) 2 credits**

This course is compulsory for all the students. It introduces the principles and methods of exercise and enables every student to master several kinds of sports skills as their own interests. The purpose is to help the students to exercise in a scientific way.



**01210251 College Physics (B) 3.0 credits**

This course introduces physical phenomena, basic concepts and principle of general physics, including mechanics, thermology, electromagnetics, photology, modern physics, etc.

**01210280 Physics Experiment (B) 1.5 credits**

This course requires students to master basic principles, experiment skills, operating method and data processing of physical experiment.

**10210030 Principles of Philosophy of Marxism 3.0 credits**

This course focuses on the basic theories of Marxism and closely combines them with practical issues in modern China. It also introduces new findings in contemporary researches on philosophy and the philosophical thinking of Mao Zedong and Deng Xiaoping.

**17210030 College English (III) 4.0 credits**

This course is designed for non-English majors. Its contents include intensive reading,

extensive reading, grammar, listening, writing, etc. The purpose of this course is to enhance the comprehensive English skills of the students. College students are expected to arrive at CET-3 in terms of English proficiency level after completing this course.

**30210030 Physical Education (III) 2.0 credits**

This course is compulsory for all the students. It introduces the principles and methods of exercise and enables every student to master several kinds of sports skills as their own interests. The purpose is to help the students to exercise in a scientific way.

**10210080 Philosophical Thoughts of Mao Zedong, Theories of Deng Xiaoping and Three Represents 6.0 credits**

This course introduces the philosophical thought of Mao Zedong and its great impact on Chinese revolution and development. It also introduces Deng Xiaoping theory and the important thought of "Three Represents" to help students set the scientific world view.



**17210040 College English (IV) 4.0 credits**

This course is designed for non-English majors. Its contents include intensive reading, extensive reading, grammar, listening, writing, etc. The purpose of this course is to enhance the comprehensive English skills of the students. College students are expected to arrive at CET-4 in terms of English proficiency level after completing this course.

**30210040 Physical Education (IV) 2.0 credits**

This course is compulsory for all the students. It introduces the principles and methods of exercise and enables every student to master several kinds of sports skills as their own interests. The purpose is to help the students to exercise in a scientific way.

**31210010 Literature Retrieval 1.0 credits**

Students are required to master retrieval methods through which they could obtain the literature and information in the most effective way.

**14211180 Anatomical Physiology 4.0 credits**

Anatomical physiology is a required course that consists of human anatomy and human physiology. It introduces the morphology and physiological function of human body.

**14211190 Experiment of Anatomical Physiology 1.5 credits**

Experiments of anatomical physiology include basic anatomy experiments and physiology experiment. Students are expected to understand the basic system of human body through models, specimens and charts. Physiology experiment skills and methods are required to be mastered through animal experiments and human subject experimentation.



**14270423 Cellular Biology (C) 1.0 credits**

This course mainly introduces cells structure, cells physiological properties, interactions with their environment, cell life cycle, division and apoptosis.

**13210011 Analytical Chemistry (A) 7.0 credits**

This course requires students to learn data processing and errors in chemical analyses, and to master the basic principles and experiment skills of titration analysis, weight analysis and spectrochemical analysis.

**13210073 Physical Chemistry (C) 4 credits**

Physical chemistry is the application of physical methods to chemistry problems. It can be organized into thermodynamics, kinetic theory, electrochemistry, chemical kinetics, and statistical classical mechanics.

**14211300 Medical Statistics 3.0 credits**

Medical Statistics provides a concise and accessible introduction for undergraduate medical students wanting a straightforward introduction to this complex subject. This course contains event and probability, random-viable and its distribution, random-variable's numeric character, limit theorem about random-variable, sample's distribution, estimating parameter, testing suppose, variability analyzing and regression analyzing.

**15211051 Biochemistry (A) 6.0 credits**

Biochemistry is the study of the molecular basis of life. This course will focus on basic concepts in biochemistry, covering the four major classes of biological molecules: proteins, carbohydrates, lipids, and nucleic acids. The emphasis will be on the chemical properties, three-dimensional structure and biological function of these biomolecules.



**14211052 Pathophysiology (B) 3.0 credits**

This course will provide the students with the general concept of pathophysiology. That will be discussed with appropriate reference to the abnormal function and structure of cardiovascular, respiratory, urinary, digestive, nervous, and reproductive systems. An organized system review of the commonest diseases with adequate insight into causes, clinical manifestations, and diagnosis will be covered. This course requires students to develop an understanding of the causes and mechanisms of disease and the associated alterations of structure and function.

**15211160 Experiment of Pharmaceutical Molecular Biology 1.0 credits**

In this course the students will learn all the basic experiment techniques of molecular biology used in a wide variety of areas in pharmaceutical sciences.

**15211171 Microbiology (A) 2.5 credits**

This course is designed to provide the student with the basic knowledge of the

pharmaceutical aspect of microbiology. Students will be familiarized with the structures and vital functions of the micro-organisms. Based on this knowledge, students are able to understand how antimicrobial drugs affect the micro-organisms and how microbes inflict diseases. Basics of immunology and human defense against micro-organisms are also discussed.

**15211182 Immunology (B) 1.5 credits**

Basic concepts of immunology, including innate immunity, antigen recognition, lymphocyte development and adaptive immunity, will lay the groundwork for understanding immunity. The student will understand how the immune system exists to protect the human host from infection, but how the development of allergy, autoimmunity, graft rejection and immunity to tumors are all variations of this function. Students will also review biotech products available for therapeutic applications, including monoclonal antibodies, cytokines, clotting factors and gene therapies, and the techniques used to prepare these products.



**16272300 Pharmaceutical Molecular Biology 2.0 credits**

This course will focus on selected aspects of molecular biology that provide the non-specialist with the principles for understanding the structure and functional relationships of molecular biology techniques including DNA manipulation, sequencing, cloning, subcloning, library construction, screening, RNA isolation and characterization, analysis of expression, cDNA synthesis (RT-PCR) and analysis, microarrays and gene chips, and Real-Time-PCR. Multiple modern day molecular biology techniques in the biotechnology and pharmaceutical industries will be presented

**14211062 Pharmacology (B) 4.0 credits**

This course is a basic pharmacology course in which principles underlying the actions of drugs are presented, including pharmacokinetics, drug-receptor interactions, and drug metabolism. In addition, mechanisms of action, therapeutic effects, adverse

effects and therapeutic indications are noted.

**14211350 Experiment of Pharmacology 2.0 credits**

In this course, the student gains an understanding of the mechanisms by which drugs may produce their effects, and masters a variety of methods and procedures commonly employed in xperimental pharmacology.

**16211030 Pharmaceutical Analysis 4.0 credits**

The course provides an introduction to the instrumental methods of analysis including spectroscopic methods of analysis such as UV – VIS and flourimetry in addition to the following electro chemical methods: conductometry, potentiometry, amperometry and polarography. This course also aims to introduce to students the concept of applying instrumentation for the separation of mixtures as well as qualitative and quantitative analysis of medicinal and pharmaceutical formulations. The course covers different chromatographic methods and techniques (PC, TLC, IEC, CC, GPC, GC, HPLC) in addition to infra-red spectroscopy, nuclear magnetic resonance and mass spectroscopy.



**16211040 Experiment of Pharmaceutical Analysis 3.0 credits**

The students will gain practical skills to operate commonly used analytical laboratory instruments and understand fundamental principles of experimental design. The course enables students to apply good experimental design techniques and use statistical methods for data evaluation, and develop validated analysis methods for determining chemical compounds and elements in a range of samples.

**16211050 Medicinal Chemistry 3.0 credits**

This course presents the fundamental of certain topics in organic chemistry. It covers some important areas in organic chemistry, which include aliphatic and aromatic hydrocarbons, alkyl and aryl halides, alcohols, ethers and epoxides. It emphasizes the pharmaceutical importance of these functional groups. It also includes basic chemical

reactions and mechanisms, stereochemistry, phenols, aldehydes, ketones, and carboxylic acid and acid derivatives, properties and reactions of difunctional compounds, amines, aromatic and heterocyclic compounds, and introduction to organic natural products.

**16211060 Experiment of Medicinal Chemistry 3.0 credits**

This course includes laboratory work concerning specific chemical reactions, organic synthesis and identification of organic compounds.

**16210140 Experiment of Pharmacognosy 2.0 credits**

This course will offer laboratory exercises in the chromatography, bioassay, plant tissue, culture, field observation, and microscopic analysis of medicinal plants.



**16211012 Medicinal Chemistry of Natural Products (B) 3.0 credits**

This course will investigate secondary plant constituents as well as methods of separation, purification, and identification for various classes of plant components. The historical development, structures, reactions, and biosynthesis of active compounds will also be emphasized.

It will also provide lectures on the screening of natural products for biological activities, instruction of pre-screening methods, screening methods to assay certain natural product activities, isolation of active compounds using activity-guided fractionation, and structural elucidation. The animal cell and plant tissue culture systems will be introduced as techniques for enhancing the yield of secondary products.

**16211020 Experiment of Medicinal Chemistry of Natural Products 3.0 credits**

The course introduces the student to advanced spectroscopic methods including infrared, ultraviolet, and nuclear magnetic resonance spectroscopy and mass spectrometry that are used to analyze products prepared and/or isolated. It also

requires students to master qualitative analysis of organic compounds.

**16272210 Pharmacognosy 3.0 credits**

This course will cover all aspects of natural products used as the pharmaceuticals derived from plants and microbes, such as origin, morphology, histology, constituents and use. The chemistry, biosynthesis, and pharmacological activities of secondary metabolites derived from plants and microbes will be introduced.

**01210230 Linear Algebra 2.0 credits**

This course is on matrix theory and linear algebra. Emphasis is given to topics that will be useful in other areas, including systems of equations, vector spaces, determinants, eigenvalues, similarity, and positive definite matrices.



**03210072 Chemical Engineering Cartography B 2 credits**

The aim of the course is to provide theoretical and practical chemical engineering cartographical knowledge and skills, relevant to the needs of the industry and society.

**06210010 Foundations of Computer Application 2 credits**

This course is designed for those students intending to major or minor in computer science or computer information systems. Topics include the internal representation of values and instructions, digital logic and circuits, machine language, network terminology and architecture, parallel and distributed algorithms, data communications, security, and the use of global networks.

**14211024 Histology and Embryology D 1 credits**

This course will study microscopic anatomy dealing with the structures of cells, tissue and organs in relation to their functions and emphasize the embryologic development of the human body, the relationship between body structure and function, and the use of gross human anatomy in physical diagnosis

**14270060 Laboratory Animal Science 1 credits**

The objective of the course is to present basic facts and principles that are essential for the humane use and care of animals and for the quality of research. From the beginning of the course, emphasis is placed on the fact that the scientist is the central person in the design and performance of animal experiments, and that he/she has specific responsibilities with respect to the welfare of the animals used.

**15270100 Parasitology 1 credits**

This course focuses on the parasites of medical importance that cause human morbidity and mortality throughout the world. It also introduces the student to the g eneral aspects of parasitology. The developmental biology, natural history, and cell and molecular biology of the major eukaryotic parasites will be discussed. Also, the fundamental mechanisms of host-parasite relationships, diagnosis, pathogenesis, epidemiology, and control strategies will be emphasized.



**16210150 Physical Pharmacy 2 credits**

This course integrates knowledge of mathematics, physics and chemistry to explain the basic principles of physical and chemical phenomena related to drug formulation and drug delivery. Topics include application of colligative properties in preparation of pharmaceutical solutions, micromeritics, interfacial phenomenon, rheology, dispersions, diffusion, dissolution, complexation, buffers, solubility and related phenomena

**16272290 Stereochemistry 2 credits**

This course covers the stereochemistry of organic compounds, chirality, resolution and analysis of enantiomers and diastereomers, conformational isomerism and geometrical isomerism. Introduction to stereoselective synthesis and drug design will be given to the students. In addition, stereoselectivity in nature and spectroscopic determination of relative and absolute chirality will be discussed.

**14270490 Introduction to Traditional Chinese Medicine 2 credits**

This course is is an introductory course in Chinese traditional medicine, including Chinese medicine and Chinese medicine based diagnostics. This course requires students to master the philosophical basis of Chinese medicine and understand the traditional Chinese medicine diagnosis and treatment of the principles of dialectical method.

**16270230 Traditional Chinese Medicine Resource Science 2 credits**

In this course, the students may use herbal science, plant science, plant chemistry, pharmacology and other disciplines of Chinese medicine ways and means to conduct in-depth study of traditional Chinese medicine resources, expand the medicinal resources, and learn the development of Chinese medicine and drugs.



**16272200 Chinese Materia Medica 2 credits**

Chinese materia medica is a course that students study the basic theory of Chinese pharmacy as well as the origin, collection, properties, action and clinical application of traditionla Chinese medicines.

**13211073 Chemical Engineering Principle 2 credits**

Introduction to chemical engineering analysis and computations. Course starts with unit conversions and conventions for representing processes and process variables in engineering calculations. Continued with methods for generating flow sheets and analyzing mass balances both with and without chemical reactions. Rules associated with energy conservation and energy balance calculations in non-reacting and reacting systems are also covered. Ultimately, full process calculations, including chemical reactions with energy changes and multiphase systems are covered.

**13211112 Chemical Engineering Principle Experiment B 1 credits**

In this course experimental applications of physical and chemical principles using pilot scale equipment are used. Experiments illustrate major unit operations:

distillation; absorption; reactors; extraction; humidification; heat exchange.

**16210071 Industrial Pharmacy A(I) 2 credits**

**16210081 Industrial Pharmacy A(II) 2 credits**

These two courses are designed for physical and chemical science students, who wish to embark on a career in pharmaceutical research or manufacturing or government agencies. The program provides essential knowledge and practical experience of medicine manufacture, design and quality assurance.

**16210320 Industrial Pharmacy Experiment(I) 2 credits**

**16210330 Industrial Pharmacy Experiment(II) 2 credits**

These two courses are designed to carry out the experiments of industrial pharmacy for the students. Including the preparation for the injection, soft capsule, tablet, emulsion and so on. And the investigation on the stability of different dosage forms was also introduced.



**16210250 Preparation Equipment and Process Design Workshop 2 credits**

In this course, the student can master the design principles, methods and agent production for the use and maintenance of the pharmaceutical equipment, and the principle for the workshop design for pharmaceutical.

**16270020 Biopharmaceutical Analysis Experiments 2 credits**

Students are required to master the basic methods and skills for the *in vivo* drug analysis; and correct handling of data and analysis results that improve the ability to analyze and solve problems; basic experimental skills through a rigorous training are also introduced.

**16270030 Biopharmaceutical Analysis 2 credits**

This course describes the basic theory of *in vivo* drug analysis. It describes the sample pretreatment methods, the establishment of *in vivo* drug analysis and evaluation

methods, focusing on a variety of modern analytical methodologies techniques *in vivo* drug analysis.

**16270010 Biopharmaceutics and Pharmacokinetics 2 credits**

This course will introduce the characterization of the time course of drug absorption, distribution and elimination, drug accumulation. Concept of clearance, half-life and volume of distribution and design of multiple dosing regimens are also introduced. And this course also emphasis on physiologic pharmacokinetics, therapeutic drug monitoring, design of dosage regimens in selected disease states, and the relationship of drug concentration to intensity and duration of drug effects.

**16270060 Biopharmaceutics and Pharmacokinetics Experiments 2 credits**

The purpose of this course is to enable students to master the method of determination of kinetic parameters, kinetic parameters and the *in vitro* and *in vivo* correlation evaluation. By biopharmaceutics and pharmacokinetics experimets training, each student may master basic skills and experimental data analysis and processing capabilities for solving the various parameters.



**16270040 Introduction to the Modern Pharmacy 1 credits**

This course introduce the modern development in pharmacy. And the novel dosage form are also introduced to the students, such as sustained-release dosage form, targeting dosage form, controlled-release dosage form and so on. Through this course, the students may master the concept, importance and classification of dosage forms and formulations

**16270130 Pharmacy Administration and Statute 2 credits**

The course will introduce knowledge on medical host file editing, current medical registration processes in China, America, EU and Japan, as well as purified water system and analytical method validation closely related to pharmaceutical production. This course aims to help students build up ability of working on international

pharmaceutical administration and registration, and contribute to cultivate QA managers and pharmaceutical administration registrants meeting international needs.

**16270170 Pharmaceutical Polymers 2 credits**

Basic concepts of polymer sciences, radical free polymerization, anionic polymerization, cationic polymerization, condensation polymerization, chemical reaction of polymers, structure, properties of polymers, motions of polymers, intrduction of pharmaceutical polymers, including biodegradable polymers, such as PLA, PGA, PCA, polycarbonates, poly(ortho esters), polyanhydride, PHA, poloxamers, some pharmaceutical polymer products, such as cellulose derivatives, starch derivatives, polyacrylates, PVP, PEG and so on.

**16210220 Pharmaceutical Polymers Experiments 1 credits**

Through this course, students may master the basic theory of polymer materials, natural polymer and its derivatives, pharmaceutical synthetic polymer, and the structure, physical and chemical properties of the polymers. The students may also apply the basic knowledge to a preliminary understanding of polymer materials in general pharmaceutical preparations, controlled release preparations and sustained release preparation of applications.



**16270000 Formulas of Chinese Medicine 2 credits**

Formulas of Chinese Medicine is the study of the compatibility of prescription and clinical application, it is one of the professional basic course for the Chinese medicine s. In this course, the students master 150 common prescriptions about the composition, usage, indications, compatibility meaning.

**16270190 Science of Processing Chinese Materia Medica 1 credits**

Processing of Chinese herbal medicinals is a specialty that studies the theory, technology and standards concerning the processing of Chinese herbal medicinals. It is a compulsory for traditional chinese medicine courses. Through this course,

enabling students to master the basic theory of traditional Chinese medicine processing and skills.

**15270940 Pharmacology of Chinese Materia Medica 2 credits**

Pharmacology of Chinese materia medica is based on the basic theory of Chinese medicine. And the modern scientific methods were used to study the interaction between the body and the role of Chinese medicine and the the mechanism of Chinese medicine Function.

**16270200 Pharmacy of Chinese Materia Medica 2 credits**

Pharmacy of Chinese materia medica is based on Chinese medicine theory, the use of modern science and technology, pharmaceutical preparation of Chinese herbal medicine theory, production techniques, quality control and rational application of a comprehensive technical content of science. Through the courses, the students may master the concepts of Chinese medicine formulations used, characteristics, manufacturing process and quality requirements of the basic theory, basic knowledge and skills, familiar with the theory of modern pharmacy.



**16210310 Tissue Engineering 2 credits**

This course will present the primary components, design principles, and engineering concepts central to the field of tissue engineering. First, the biological principles of tissue formation during morphogenesis and wound repair will be examined. The cellular processes underlying these events will be presented with an emphasis on microenvironment regulation of cell behavior. Biomimetic approaches to controlling cell function and tissue formation via the development of biomaterial systems will then be investigated. Case studies of regeneration strategies for specific tissues will be presented in order to examine the different tissue-specific engineering strategies that may be employed. Special current topics in tissue engineering will also be covered.

**16272240 Biological Products and Technology 2 credits**

The course combined biology, chemistry, engineering, medical and pharmaceutical knowledge, and the industrialization of bio-engineering. Through this course, students familiar with the production of bio-engineering and bio-reaction of the basic principles of the basic unit operations, control of several major categories of production engineering production technology for future learning and work practice to lay a solid foundation.

**16210120 The Formulation Research for the Biomacromolecule 2 credits**

In this course, the students may learn the modern progress in the biomacromolecule formulation, such as encapsulation, microsphere or liposome formulation. The students may also learn how to evaluate the novel dosage form *in vitro* and *in vivo*.

**16210230 Vaccinology 1 credits**

Vaccinology is a cross-disciplinary subject and the most exciting developments in vaccinology have occurred when people from diverse research, business and medical backgrounds have used their skills to collectively tackle problems in vaccine design, manufacture and distribution. The course will cover aspects of vaccinology, from basic immunology, the process of development of a vaccine, the licensure and regulatory requirements, the process of introducing a new vaccine into a country, vaccine trials, and translation of research into policy.



**16210180 Pharmaceutical Synthesis Reactions 2 credits**

In this course, the students can master the pharmaceutical synthesis reaction mechanism, structure of reactants, reaction conditions and reaction direction of the relationship and the main factors influence the reaction.

**16270050 Drug Research and Development 1 credits**

Through this course, students understand the domestic and international evolution of new drug research and development, current situation and development trend, familiar with our current classification of drugs, drug registration procedures, prescription

drugs and the transfer of the certificate.

**16270250 Pharmaceutical Marketing 1 credits**

Through this course, students are required to master the basic principles of pharmaceutical marketing and strategy, also to understand the contemporary domestic and international marketing of new ideas and new methods.

**16272270 Bioengineering 2 credits**

This courses sample the wide variety of bioengineering options for students who plan to major in one of the undergraduate engineering degree programs. The beginning lectures describe the science basis for bioengineering with particular emphasis on molecular cell biology and systems biology. Bioengineering faculty will then describe the bioengineering options in a particular engineering course as well as the type of research conducted by faculty in the department.



**16210130 Microencapsulated for the Bioactive Substances and Research Progress 1 credits**

In this course, the students may learn the modern formulation and technology for the microencapsulation process. And the students can also learn how to evaluate the microencapsulation *in vitro* and *in vivo*.

**16210190 Pharmacoeconomics 2 credits**

Pharmacoeconomics mission is to enable students to master and familiar with the theory and methods, and the basic knowledge of drug economics to analyze and solve practical pharmacy resource allocation and use of drug problems.

**00260030 School Education, Military Training 1 credits**

School education course will teach the fresh undergraduate about the discipline and the culture in the university. The military training for freshmen lasted for 15 days, during which srudents study some military theories and carry on different trainings.

**16260010 Hospitals and Plant Practice 1 credits**

The students will be required to practice in the hospital and plant for about 1 week. In this week, the students can study the the process of hospitals and factories.

**16260040 Chinese Medicine Collection in the Field 1 credits**

The students will carry out the Chinese medicine collecting in the field for about 1 week. In this week, the student will master and familiar with common medicinal plants in Jiangsu Province.

**16260020 Comprehensive Experiments in Chinese Traditional Medicine 2 credits**

In this couse, the students may master the basic operation for the general experiments in Chinese traditional medicine, sush as extraction, identification, analysis and other basic test method.



**16260260 Comprehensive Experiments in Medicine 2 credits**

This course involved pharmacognosy, natural medicine, chemistry, pharmacy and pharmaceutical analytical, the comprehensive practice may arise students interest in learning the data access, agent configuration, the extraction of drugs, design, purification, preparation of the design, and the results of the analysis are done by the students themselves.

**16260100 Graduation Practice 16 credits**

Individual research topics selected from the areas of industrial pharmacy, physical pharmacy, or biopharmaceutics. The graduates will finish the graduation practice in lab or in factory for 5 months.