药学专业本科人才培养计划
（留学生班）
Undergraduate Program for Specialty in Pharmacy
(Foreign Student)

一、培养目标
I. Program Objectives

本专业培养能从事药物及其制剂研究、生产、药品质量检验及监督管理和医药经营、医药管理工作的高层次药学人才。

This program aims at cultivating high-quality pharmacists capable of conducting research, manufacturing, quality control, monitoring administration of drugs and their preparations, and curatorial operation and administration.

二、基本规格要求
II. Learning Outcomes

本专业学生应具有化学和医学的基础知识，掌握药学专业知识和技能，具备从事药物及其制剂的研究开发、生产、药品质量检验及管理的初步能力，精通药学教育和药学实践。 毕业后能从事药物研究、药品生产、药品质量检验与监督管理、卫生部门从业药师等工作。

毕业生应获得以下的态度、知识和技能：

Students of this specialty should have the basic knowledge of chemistry and medicine, master the specialized knowledge and techniques of pharmaceutical science, and excel in pharmacy education and practice. After graduation, they will be eligible for engaging in drug R&D, manufacturing, quality control and management, and health care sector.

Graduates should acquire the following morals, knowledge and abilities:

态　　度　　要　　求

1. 树立使用现代化社会最优、最进步的专业知识和技术为病人提供服务的思想观念。

2. 认识到以病人为本，以健康为本，一切执业活动围绕病人的健康展开的工作职责，以确保生产、销售、配发、使用的药品安全、有效、经济、合理。

3. 遵守行业道德，坚决制止生产、出售、使用假药、伪劣药物的行为。

4. 有对技术精益求精的精神，对工作、事业极端负责。

5. 坚持社会效益和经济效益并重的原则。

6. 树立正确的医学伦理观念，尊重个人信仰，尊重每一个人，理解其人文背景及文化价值。

7. 树立终身学习观念，充分认识到不断自我完善和接受继续教育的重要性。

8. 具有创新精神和敢于怀疑、敢于分析批判的精神，具有为新知识产生，新技能的发现做出贡献的意识。

9. 尊重同仁，增强团队意识。

10. 树立法制观念，在职业活动中坚持原则，敢于维护人民健康利益。

Attitude Requirements

1. Create the concept of applying the advanced expertise and techniques of the modern society to serve the patients.

2. Take the patients and their health as the prior responsibility, focus all professional activities on the benefits of patients and their health, so as to ensure the safety, effectiveness, economy and soundness in the process of drug manufacturing, marketing, distributing and using.

3. Observe the professional morals, firmly prohibit the behavior of producing, selling and using fake medicines or substandard-quality medicines.

4. Have the spirit of striving for perfection and be responsible for the work and career.

5. Insist on the principle of keeping equal attention to the social benefits and economic results.

6. Establish the idea of medical ethics, respect personal faith, respect every person, and have a good understanding of his humane background and cultural value.

7. Establish the idea of studying throughout one's life and fully realize the importance of going on unceasing self-perfection and receiving continued education.

8. Establishing the initiative spirit and spirits of daring to doubt and of daring to analyze and criticize, have the ideology of wishing to make contributions to the formation of new knowledge and to the discovery of new skills.

9. Respect colleagues and establish team spirit.

10. Keep the concept of law in mind. Insist on principles in the professional practice, be brave to maintain the people's interests of health.

知　　识　　要　　求

1. 基本掌握化学、生物科学、行为科学和社会科学的有关知识和方法，并能够用于指导未来的学习和药学实践。

2. 掌握药物结构、性质与生物活性之间相关性的基础理论和基本知识。

3. 掌握基本的药理知识及临床合理用药原则。

4. 熟悉药效学和药物安全性评价的基本知识和方法。

5. 掌握药物鉴定、检查和质量控制的知识。

6. 掌握药物剂型的设计与制备的理论和方法。

7. 掌握药物合成、天然药物提取、分离、纯化、鉴定的知识和方法。

8. 掌握麻药、效期药和特殊药品的管理方法。

9. 掌握药事管理和药事管理法规的基本理论知识。

10. 掌握药物经济学知识，并能应用于新药、新剂型研发，提高药品的经济效益和社会效益。

11. 熟悉现代医院药学管理模式即行政管理、业务管理、药品质量管理、药物不良反应、药品临床使用反馈信息管理等。

12. 掌握传统中药学的基本理论和研究思想，了解中药现代化的实际意义。

13. 掌握生命各阶段的人体正常结构和功能，常见病的发病原因及影响因素。

Knowledge Requirements

1. Grasp the basic scientific knowledge and methods in chemistry, biology, behavior science and social science for guiding future study and pharmay practice.

2. Master the basic knowledge and theory of the drugs structure and features and their relationship with biological activities.

3. Grasp the basic pharmacological knowledge and principle for proper use of drugs in clinic.

4. Grasp the basic knowledge and methods of pharmacodynamics and safety evaluation of drugs.

5. Grasp the knowledge of identification, examination and quality control of drugs.

6. Grasp the theory and methods of the design and preparation of various drug dosages.

7. Grasp the knowledge and methods of drug synthesis and the extraction, isolation, purification and assessment of natural drugs.

8. Grasp the management of the anesthetics, drugs with expiry date issues and special drugs.

9. Grasp the basic knowledge of pharmaceutical administration and the regulations on drug administration.

10. Grasp the knowledge of drug economics and apply it to the development of new drugs and new dosages so as to increase the social benefits and economical results of the drugs.

11. Be familiar with the mode of pharmaceutical administration of modern hospitals, such as the administrative management, business management, drug quality management, untoward reaction of drugs, management for feedback information of drugs in clinical use, etc.

12. Grasp the basic knowledge and research tendency of Chinese materia medica and realize the practical significance of modernization of Chinese medicines.

13. Master the normal structure and functions of the human body at different stages of life as well as the etiological factors and influencing factors of common diseases.

技　　能　　要　　求

1. 了解药品说明书，了解药学论文的撰写要求、原则和内容。

2. 掌握药品化学合成、成分分析、药效学筛选、安全性评价的基本技能。

3. 掌握药材鉴定、中药活性成分提取、结构鉴定和药理活性筛选的基本技能。

4. 掌握制剂分析和质量控制的基本操作技能。

5. 熟悉现代药学 GMP、GSP、GLP、GCP 管理体系。

6. 掌握 HPLC、GC 等精密仪器对药物进行分离、纯化和分析的基本操作技能。

7. 掌握药物制剂的初步设计、选择药物分析方法、新药药理实验与评价方法和技能。

8. 熟悉药事管理法规和政策。

9. 熟悉医药市场调研、药品开发和营销的基本技能。

10. 结合药品研发，能够独立利用图书馆和其他信息资源，获取新产品、新剂型、新工艺、新筛选方法等新知识。

11. 具备合理用药宣传能力，与医患护交流的能力和产品开发、协调沟通的能力。

12. 具有利用各种信息资源和信息技术进行自主学习与研究的能力。

13. 掌握一门外语，具有应用语言的能力。

Skills Requirements

1. Have a good comprehension of drug instructions and know the requirements, rules and contents for writing a pharmaceutical paper.

2. Grasp the basic skills in chemical synthesis, component analysis, effects screening and safety evaluation of drugs.

3. Grasp the basic skills in identification of medicinal material, extraction of active components, structure assessment and screening of pharmacological activities of Chinese drugs.

4. Grasp the basic operating skills in analysis and quality control of drug preparations.

5. Be familiar with the management systems of modern pharmaceutical practices such as GMP, GSP, GLP, and GCP.

6. Grasp the basic operating skills of drug isolation, purification and analysis with precision instruments like HPLC, GC.

7. Grasp the methods and skills in preliminary designing of drug preparations, selecting protocols for drug analysis, and experimentation and evaluation of pharmacological effects of new drugs.

8. Be familiar with the regulations and policies of pharmaceutical administration.

9. Be familiar with the basic skills in pharmacy market investigation, drug development, and drug sales management.

10. Be able to make use of library and other information resources for obtaining new knowledge on new products, new formulations, new techniques and new screening methods related to drug development independently.

11. Be able to publicizing rational use of drugs, communicating with doctors, nurses and patients and coordinating with people related in drug development.

12. Be able to utilize various information resources and techniques for study and research independently.

13. Master a foreign language and be able to read and translate materials of the specialty skillfully.

三、培养特色

III. Program Highlights

将人文、信息、计算机知识与药学知识相结合，培养具有良好素质的药学专业人才。

This program integrates the knowledge of humanities, information and computer science with that of pharmacy so as to broaden the cultivation of talents of good quality in pharmaceutical specialty.

四、主干学科

IV. Main Discipline

化学 Chemistry 、药学 Pharmacy

五、学制与学位

V. Program Length and Degree

学制：基本为四年，实行弹性学制。

Duration：Basic system: 4 years, plus flexible system

授予学位：理学学士

Degrees Conferred: Bachelor of Science

六、学时与学分

VI.Credits Hours and Units

完成学业最低课内学分（含课程体系与集中性实践教学环节）要求：178.5 学分

Minimum Credits of Curricular(Comprising course system and intensified practical training):178.5 credits

其中，专业基础课程、专业核心课程学分不允许用其他课程学分冲抵和替代。

Major-related basic courses and core courses cannot be covered using credits from other courses in the program.

1. 课程体系学时与学分

Course Credits Hours and Units

课程类别		课程性质	学时/学分	占课程体系学分比例（%）
素质教育通识课程		必修	168/10.5	5.88
学科基础课程	学科大类基础课程	必修	1312/82	45.94
专业课程	专业核心课程	必修	1176/73.5	41.18
集中性实践教学环节	综合实践	必修	1w/0.5	0.03
	毕业实习	必修	24w/12	6.72
合　　计			2656+25w/178.5	100

Course Type		Required / Elective	Hrs/Crs	Percentage(%)
Essential-qualities-oriented Education General Courses		Required	168/10.5	5.88
Discipline-related Courses	Discipline-related General Courses	Required	1312/82	45.94
Major-specific courses	Major-specific Core Courses	Required	1176/73.5	41.18
Practicum Credits	Comprehensive practice	Required	1w/0.5	0.03
	Pre-graduation practice	Required	24w/12	6.72
Total			2656+25w/178.5	100

2.集中性实践教学环节周数与学分

Practicum Credits

实践教学环节名称	课程性质	周数/学分	占实践教学环节学分比例（%）
综合实践	必修	1/0.5	4.0
毕业实习	必修	24/12	96.0
合计		25/12.5	100

Practical Training	Course Nature	Weeks/Credits	Percentage（%）
Comprehensive practice	Required	1/0.5	4.0
Pre-graduation practice	Required	24/12	96.0
Total		25/12.5	100

七、主要课程

VII. Main Courses

有机化学 Organic Chemistry、分析化学 Analytical Chemistry、物理化学 Physical Chemistry、生物化学与分子生物学 Biochemistry and Molecular Biology、药物化学 Medicinal Chemistry、生药学 Pharmacognostics、天然药物化学 Natural medicinal Chemistry、药物分析 Pharmaceutical Analysis、药理学 Pharmacology、药剂学 Pharmaceutics、生物药剂学与药物动力学 Biopharmaceutics and Pharmacokinetics、药事管理学 Pharmaceutical Administration、临床药物治疗学 Clinical Pharmacotherapeutics

八、主要实践教学环节（含专业实验）

VIII. Practicum Module (experiments included)

综合实习 Comprehensive Practice、毕业实习 Pre-graduation Practice

九、教学进程计划表

IX. Course Schedule

院（系）：同济医学院　　专业：药学（留学生班）

School(Department):Tongji Medical college　　Specialty: Pharmacy (Foreign Student)

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including				设置学期 semester
						大课 lecture	小课 tutoral	实验/实践 exp/prac	课外 extra	
素质教育通识课程 Essential-qualities-oriented Education General Courses	必修 Required	SIE0021	汉语 Chinese	120	7.5	120				1
	必修 Required	SIE0011	中国概况 Survey of China	32	2	32				1
	必修 Required	SIE0001	国际学生新生导入课 International Students' Orientation Course	16	1	16				1

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including				设置学期 semester
						大课 lecture	小课 tutoral	实验/实践 exp/prac	课外 extra	
学科基础课程·学科大类基础 Discipline-related General Courses	必修 Required	PHA0561	无机化学 Inorganic Chemistry	104	6.5	72		32		1
	必修 Required	PHA0612	有机化学（一） Organic Chemistry （Ⅰ）	56	3.5	56				1
	必修 Required	PHA0622	有机化学（二） Organic Chemistry （Ⅱ）	120	7.5	80		40		2
	必修 Required	PHA0541	高等数学 Introduction to Calculus and Analysis	64	4	64				2
	必修 Required	PHA0631	中医药学概论 Concept of Traditional Medicine	32	2	32				2
	必修 Required	PHA0522	分析化学 Analytical Chemistry	136	8.5	96		40		2
	必修 Required	BMS0515	系统解剖学 Systematic Anatomy	128	8	80		48		3
	必修 Required	BMS0555	病原生物学 Pathogenic Organisms	128	8	74		54		3
	必修 Required	PHA0572	物理化学 Physical Chemistry	96	6	64		32		3
	必修 Required	PHA0551	生物化学与分子生物学 Biochemistry and Molecular Biology	120	7.5	78		42		3
	必修 Required	PHA0591	药用植物学 Planfa Medica	64	4	36		28		3
	必修 Required	PHA0581	药学导论 Review of Pharmacy	32	2	32				1
	必修 Required	BMS0744	生理学 Physiology	112	7	100		12		4
	必修 Required	PUH2081	卫生统计学 Health Statistics	72	4.5	50		22		4
	必修 Required	BMS0805	医学免疫学 Medical Immunology	48	3	36		12		5
专业核心课程 Major-specific Core Courses	必修 Required	PHA2112	生药学 Pharmacognostics	104	6.5	72		32		4
	必修 Required	PHA2202	药物化学 Pharmaceutical Chemistry	104	6.5	72		32		4
	必修 Required	PHA2143	药剂学 Pharmaceutics	136	8.5	72		64		6
	必修 Required	PHA2181	药物分析 Pharmaceutical Analysis	112	7	72		40		5
	必修 Required	PHA2082	生物药剂学与药代动力学 Biopharmaceutical &Pharmacokinetics	96	6	64		32		5
	必修 Required	PHA2071	生物技术制药 Drug Production by Biotechnology	96	6	48		48		5

续表

课程类别 course type	课程性质 required/ elective	课程代码 course code	课程名称 course name	学时 hrs	学分 crs	其中 Including				设置学期 semester
						大课 lecture	小课 tutoral	实验/实践 exp/prac	课外 extra	
专业核心课程 Major-specific Core Courses	必修 Required	PHA2151	药理学 Pharmacology	96	6	56		36	4	6
	必修 Required	PHA2171	药事管理学 Pharmaceutical Administration	32	2	32				6
	必修 Required	BMS0941	临床药理 Clinical Pharmacology	64	4	40		20	4	6
	必修 Required	PHA2241	医药市场营销 Medicine Marketing	32	2	32				6
	必修 Required	PHA2121	天然药物化学 Natural Medicinal Chemistry	112	7	64		48		5
	必修 Required	PHA2061	临床药物治疗学 Clinical Pharmacotherapeutics	48	3	48				7
	必修 Required	PHA2251	医院药房管理 Management of Hospital Pharmacy	32	2	32				7
	必修 Required	PHA2211	药物流行病学 Pharmacoepidemiology	16	1	16				7
	必修 Required	PHA2132	新药研究与开发 New Drug Research and Development	96	6	24		72		7
实践环节 practical training items	必修 Required	PHA3541	综合实习 Comprehensive Practice	1w	0.5			1w		7
	必修 Required	PHA3511	毕业实习 Graduation Practice	24w	12			24w		8

十、说明

X. Explanations

各门课程应精选教学内容，改进教学方法，强化基础理论、基本知识和基本技能的训练，加强自学能力、实践能力、外语及计算机应用能力和初步科学研究能力的培养，加强早期接触专业，注重基础与专业的渗透，加强专业素质教育，加强文科、理科知识，提高心理素质,拓宽学生的专业面和知识面，注重人际交流，增强社会适应性，提高学生的整体素质。

1. 教学内容分课内和课外教学，课内教学形式包括大课、小课（讨论课、案例教学等）、实验课、实习等；课外教学是指学生通过课外自主学习、社会实践等形式学习教学大纲要求的教学内容（不包括学生复习）。

2. 科研能力训练：科研能力训练贯穿在各个教学环节，在基础课教学阶段，学有余力的学生可参加课外科研活动；在专业课教学阶段，结合专业知识，进行科研训练；还应结合假期社会实践开展科研性质的社会调查研究。

Every course should carefully select and improve teaching methods; strengthen the training of basic theory, basic knowledge and basic skills; enhance the cultivation of self-study ability, practice ability, foreign language and computer application ability, and preliminary ability in scientific research; pay attention to an early contact with specialties, the infiltration between basis and specialties and

strengthen the education of professional qualities. Lay stress on the imparting of knowledge of liberal arts and science, improve psychological quality and medical ethics; broaden students' range of specialty and knowledge; pay attention to interpersonal communication, promote social adaptation and raise the integrate qualities of students.

1. Foreign language teaching: General foreign language adopts the system of grade teaching and requires that every student must pass the National College English Test Band Four. Specialized foreign language teaching offers at least 10% of the class hour of foreign language studying for every courses as well as the course "Pharmaceutical English". At least 10 common specialized foreign vocabularies should be introduced and used repeatedly within every class hours. At least 1 to 2 courses adopt foreign language textbooks or foreign language teaching in every semester.

2. Research ability training: Ability training for scientific research should be carried out through all links in the teaching process. In the period of basic course study, students studying with remaining strength are encouraged to take part in research activities outside class. During the specialty course study, training in research work can be carried out by combining specialty knowledge. Furthermore, social investigations with a quality of scientific research can be conducted in combination with holiday social practice.

十一、基准学期进程安排表

第一学期 The First Semester							第二学期 The Second Semester						
课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs	课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs
	大课 lec.	小课 tut.	实验 exp.					大课 lec.	小课 tut.	实验 exp.			
汉语 Chinese	120				120	7.5	中医药学概论 Concept of Traditional Medicine	32				32	2.0
国际学生新生导入课 International Students' Orientation Course	16				16	1.0	高等数学 Introduction to Calculus and Analysis	64				64	4.0
中国概况 Survey of China	32				32	2.0	有机化学（二） Organic Chemistry II	80		40		120	7.5
无机化学 Inorganic Chemistry	72		32		104	6.5	分析化学 Analytical Chemistry	96		40		136	8.5
有机化学（一） Organic Chemistry I	56				56	3.5							
药学导论 Review of Pharmacy	32				32	2							
合 计 Sum	360				360	22.5	合 计 Sum	352				352	22.0

第三学期 The Third Semester							第四学期 The Fourth Semester						
课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Credits	课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs
	大课 lec.	小课 tut.	实验 exp.					大课 lec.	小课 tut.	实验 exp.			
药用植物学 Planta Medica	36		28		64	4	生理学 Physiology	100	12			112	7.0
系统解剖学 Systematic Anatomy	80		48		128	8.0	生药学 Pharmacognostics	72		32		104	6.5
病原生物学 Pathogen Biology	72		54		28	8.0	药物化学 Medicinal Chemistry	72		32		104	6.5
物理化学 Physical Chemistry	64		32		96	6.0	卫生统计学 Health Statistics	50		22		72	4.5
生物化学与分子生物学 Biochemistry and Molecular Biology	78		42		120	7.5							
合 计 Sum	536				536	33.5	合 计 Sum	392				392	24.5

第五学期 The Fifth Semester							第六学期 The Sixth Semester							
课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs	课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs	
	大课 lec.	小课 tut.	实验 exp.					大课 lec.	小课 tut.	实验 exp.				
天然药物化学 Natural Medicinal Chemistry	64		48		112	7.0	药剂学 Pharmaceutics	88		48		136	8.5	
医学免疫学 Medical Immunology	36			12	48	3.0	药事管理学 Pharmaceutical Administration	32				32	2.0	
药物分析 Pharmaceutical Analysis	72		40		112	7.0	临床药理 Clinical Pharmacology	40		20	4	64	4.0	
生物药剂学与药物动力学 Biological Pharmacokinetics	64		32		96	6.0	医药市场营销 Medicine Marketing	32				32	2.0	
生物技术制药 Drug Production by Biotechnology	48		48		96	6.0	药理学 Pharmacology	56		36	4	96	6.0	
合 计 Sum	452			12	464	29.0	合 计 Sum	352			8	360	22.5	
第七学期 The Seventh Semester							第八学期 The Eighth Semester							
课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs	课 程 Course	课内 curricular			课外 extra-cur.	总学时 Hrs	学分 Crs	
	大课 lec.	小课 tut.	实验 exp.					大课 lec.	小课 tut.	实验 exp.				
临床药物治疗学 Clinical Pharmacotherapeutics	48				48	3.0	毕业实习 Pre-graduation Practice			16w		16w	12.0	
医院药房管理 Management of Hospital Pharmacy	32				32	2.0								
药物流行病学 Pharmacoepidemiology	16				16	1.0								
综合实习 Comprehensive Practice			1w		1w	0.5								
新药研究与开发 New Drug Research and Development	24		72		96	6.0								
毕业实习 Graduation Practice			8w		8w									
合 计 Sum	192/13w				192/13w	12.5	合 计 Sum	16w				16w	12.0	

说明 Directions：综合实习 Comprehensive Practice

It will take 5 weeks for the comprehensive practice in pharmaceutical manufacturing companies, pharmaceutical commercial companies, hospital pharmacies, and institutes for food and drug control.

毕业实习 Pre-graduation Practice

It will take 24 weeks for the pre-graduation practice with the guidance of the faculty in School of Pharmacy. Thesis preparation and oral defense will be required and evaluated before graduation.