

## Appended Form 1

## Specifications for Major Program

Name of School (Program) [School of Pharmaceutical Sciences (Program of Pharmaceutical Sciences)]

Program name (Japanese)	
(English)	Program of Pharmaceutical Sciences

1. Degree to be obtained: Bachelor of Pharmaceutical Science

## 2. Overview

The Program of Pharmaceutical Sciences aims to foster students who are able to develop a new field of knowledge and contribute to local/global communities having a rich humanity by reinventing themselves looking ahead the future society based on the tradition of the pharmaceutical sciences. Specifically, this program provides students education to allow them to acquire 1) the fundamental knowledge and skills required to become pharmacists who are capable of understanding and diagnosing a patient's condition, of judging and suggesting prescriptions, and of taking responsibility for appropriate use of medicines and medical supplies; 2) the advanced skills required for exercising their creative thinking abilities to try to solve new problems actively and autonomously, as well as the opportunity to exercising those skills experimentally; 3) the advanced medical knowledge required to foster skills as pharmacists who have a high level of expertise and are capable of taking part in discussion in team medical care from a scientific point of view; 4) the ethics and improved communication skills required of a clinical pharmacist; and 5) the research abilities to orient them toward the world-leading researches in the pharmaceutical sciences and to enable them to contribute to the development of new drug therapy.

This program is highly systematically designed to foster students who will advance to graduate school and to acquire advanced knowledge and skills as expert pharmacists and ethics as medical staff while expecting them to become practical pharmacists in a medical institution, or to work as researchers engaged in such fields as the development of new medicine

mechanisms of action, and metabolic end result that are required for understanding the processes of the pharmacological action of medicines, and the ability to explain and exercise that knowledge, those skills, and that attitude;

- 5) The capability to understand basic and applied knowledge of drug therapy, and to explain the standard methods of drug therapy for major diseases of every organ;
- 6) Fundamental knowledge, skills, and attitude regarding the effect of medicines and chemical substances on a human being and the effect of living environment and global ecosystem on human health, and the ability to explain and exercise that knowledge, those skills, and that attitude;
- 7) The fundamental knowledge, skills, and attitude regarding pharmacy itself, laws and institutions related to medicines, and economics and pharmacy businesses that are required for understanding the responsibilities and duties of pharmacists in society, and the ability to explain and exercise that knowledge, those skills, and that attitude;
- 8) The fundamental knowledge, skills, and attitude for the dispensing, formulation, explanation of medicine instructions and assistance for prescription designing required for working as a member of a medical team, and the ability to explain and exercise that knowledge, those skills, and that attitude;
- 9) The ability to identify problems, and to indicate a way of solving them, to work as pharmacists who can flexibly cope with various needs of medical workers;
- 10) The fundamental capability to identify new information and knowledge, and to autonomously improve one's ability, in order to keep up with progress in pharmaceutical and other sciences and medicine;
- 11) An understanding of the importance of development of juniors medical staff, and the ability to contribute to it by educating the pharmacists of the next generation.

#### 4. Curriculum policy (policy for arranging and implementing the curriculum)

### **Program of Pharmaceutical Sciences**

#### **Policy for design, education and learning method of curriculum**

In the Program of Pharmaceutical Sciences, the curriculum (educational course) is arranged according to the policies described below in order to develop medical staff who have abilities mentioned in the diploma policy and have deep humanity and wide-ranging intelligence.

- 1) To allow students to acquire fundamental knowledge such as physics, biology, mathematics and “Psychology for Medical Care Workers” as well as basic study ability in a wide variety of areas, the curriculum provides the peace study subjects, fundamental subjects for university education, disciplinary subjects, foreign language subjects, information and data science subjects, health and sports subjects, society-related subjects, and fundamental subjects, structured in such a way as to provide those subjects to the whole university in the 1<sup>st</sup> and 2<sup>nd</sup> year;
- 2) To allow students to understand the fundamental characteristics on medicines and chemical substances including biological materials, and to learn the fundamental knowledge about typical reactions, separation methods, configuration determination methods, etc., the curriculum provides subjects on the structure and characteristics of materials besides natural medicine resources such as Organic Chemistry and Analytical Chemistry. After learning lectures about these subjects, the curriculum also provides the practical training subjects;
- 3) To allow students to understand structures of living organisms at the level of individuals, organs and cells, and to learn

Specialized Subjects in the 1<sup>st</sup> and 2<sup>nd</sup> year, and subjects including more advanced contents like Physiological Chemistry and Cellular Biology as Specialized Subjects in the 3<sup>rd</sup> year. After taking lectures on these subjects, the practical training subjects are prepared for the fall semester in the 2<sup>nd</sup> year and the spring semester in the 3<sup>rd</sup> year in order to acquire the technical skills based on knowledge;

- 4) To allow students to understand the process of pharmacological actions of medicines, and to get the fundamental knowledge about the medicine's actions to diseases, the action mechanism and in vivo fate, the curriculum provides subjects related to the actions and the in vivo fate of medicines such as Pharmacology and Biopharmaceutics as the Basic Specialized Subjects in the 1<sup>st</sup> and 2<sup>nd</sup> year, and subjects including more advanced contents like Pharmacokinetics as the Specialized Subjects in the 3<sup>rd</sup> year. After taking lectures on these subjects, the practical training subjects are prepared for the fall semester in the 2<sup>nd</sup> year and the spring semester in the 3<sup>rd</sup> year in order to acquire the technical skills based on knowledge;
- 5) To allow students to understand the basic and advanced knowledge about the pharmacotherapy, and to learn the knowledge enough to explain the pharmacotherapy to major diseases regarding all organs, the curriculum provides the lecture subjects related to the diseases and the conditions such as Clinical Pharmacy and Pharmacotherapy in the 4<sup>th</sup> year, and group learning subjects as Program-based Learning like Clinical Pharmacology in the 5<sup>th</sup> and 6<sup>th</sup> year. The Pharmacy Practice is prepared for the fall semester in the 4<sup>th</sup> year while the Clerkships in Clinical Pharmacy are provided in the 5<sup>th</sup> year. In order to cultivate these abilities, a Seminar Subject (Japanese Pharmacopoeia) is given in the 6<sup>th</sup> year;
- 6) To allow students to learn the fundamental knowledge about effects of medicine and chemical substance to the human as well as the human health with the living environments and/or global ecosystem, the curriculum provides Lecture Subjects related to the health and the environment such as Public Health Chemistry in the 2<sup>nd</sup> and 3<sup>rd</sup> year. The practical training subjects are prepared for the 3<sup>rd</sup> year in order to acquire the technical skills and the attitudes based on knowledge;
- 7) To allow students to understand the social responsibilities and duties of pharmacists, and to learn the fundamental knowledge about laws, systems and economies regarding pharmacy and drugs as well as services at pharmacies, the curriculum provides Lecture Subjects related to the pharmacist services and the pharmaceutical affairs law such as Pharmaceutical Affairs Related Laws and Pharmacoeconomics in the 4<sup>th</sup> year. The Pharmacy Practice is prepared for the fall semester in the 4<sup>th</sup> year, and the Clerkships in Clinical Pharmacy are given in the 5<sup>th</sup> year in order to acquire more practical skills and the attitudes;
- 8) To allow students to learn the fundamental knowledge required to the pharmacist services such as drug dispensing, formulation and medication counseling in order to participate in the medical care as a team member, the curriculum provides Lecture Subjects related to the formulation adjustment and the drug management like Industrial Pharmaceutics and Drug Informatics in the 3<sup>rd</sup> and 4<sup>th</sup> year. The Pharmacy Practice is prepared for the fall semester in the 4<sup>th</sup> year, and the Clerkships in Clinical Pharmacy are given in the 5<sup>th</sup> year in order to acquire more practical skills and the attitudes;
- 9) To allow students to acquire the essential abilities to find and solve problems to be active as a pharmacist who can deal flexibly with the multiple needs required as a provider of medical care, the curriculum provides Seminar Subjects: Research Practices for the fall semester in the 3<sup>rd</sup> year, subjects including basic contents: Special laboratory Works in Pharmaceutical Sciences I -II for the fall semester in the 3<sup>rd</sup> year and in the whole 4<sup>th</sup> year, and subjects including more advanced contents: Special laboratory Works in Clinical Pharmacy I – III as the Specialized Study for

Graduation, well-instructing students individually;

- 10) To allow students to acquire the fundamental abilities required to keep improving themselves grasping the new information and knowledge in order to deal with progresses of pharmacy, sciences and medical cares, the curriculum provides a more professional foreign language subject: Practical English for Pharmaceutical Students in the 2<sup>nd</sup> year in addition to the Foreign Languages Subjects in the 1<sup>st</sup> and 2<sup>nd</sup> year. Besides, The Specialized Study for Graduation Subjects: Special laboratory Works in Pharmaceutical Sciences I – II and Special laboratory Works in Clinical Pharmacy I – III are provided from the fall semester in the 3<sup>rd</sup> year, well-instructing individually;
- 11) To allow students to understand the importance of teaching younger people and to acquire the abilities to carry it out in order to foster the next-generation pharmacists, the curriculum creates an environment in which students support the Specialized Study for Graduation of younger members in the same laboratory;

### **Evaluation Policy for Learning Achievements**

The learning achievements are evaluated by the suitable ways to each learning method of the curriculum based on the above Curriculum policy 1) to 11), and the program aims to achieve the Diploma policy. Basically, the Lecture Subjects are evaluated by written-examinations or written-examinations besides report assignments. The Practice Subjects are evaluated comprehensively by report assignments, practice notes, etc. The participatory learning subjects are evaluated by report assignments and presentation. The Seminar Subjects are evaluated by written-examinations, report assignments or presentation. The Pharmacy Practice is evaluated by written and practical skills examination. The Clerkships in Clinical Pharmacy are evaluated by practice notes and presentation. The Specialized Study for Graduation Subjects are evaluated by a rubric determined separately.

Besides these evaluations, students are appraised by their attainment of the goals set by the Program of Pharmaceutical Sciences.

To promote the systematic learning, the program sets a certain standard for the assignment to laboratories. To take the Clerkships in Clinical Pharmacy, the Common Achievement Test which is also set a certain standard is assigned.

#### **5. Start time and acceptance conditions**

Students select (start) this program in the first year.

#### **6. Obtainable qualifications**

- a) Qualification for national examination for pharmacists
- b) Technical supervisor in the office for the manufacture, import, and sale of medical devices, technical manager in a waste disposal plant, pollution control manager related to noise, dust, and vibration pollution, technical manager of environmental sanitation for buildings, and technical administrator for waterworks

#### **7. Class subjects and their contents**

For class subjects, refer to the subject table in Sheet 1. (The subject table is to be attached.)

For the details of the class subjects, refer to the syllabus that is published each academic year.

#### **8. Academic achievement**

The evaluation criteria are specified for each evaluation item for academic achievement, and the achievement level against these criteria is designated for each academic year.

The academic achievement, from when the student enters our university to the end of the last semester, is represented based on the average of evaluation scores for each evaluation item. The evaluation score for each subject is converted to

a numerical value (S = 4, A = 3, B = 2, and C = 1) and the evaluation standard for the academic achievement is determined using these values while applying weightings.

Achievement evaluation	Numerical conversion
S (Excellent: 90 or more points)	4
A (Very good: 80 - 89 points)	3
B (Good: 70 - 79 points)	2
C (Passed: 60 - 69 points)	1
Academic achievement	Evaluation standard
Excellent	3.00 - 4.00
Very Good	2.00 - 2.99
Good	1.00 - 1.99

\* Refer to the relationship between evaluation items and evaluation criteria described in Sheet 2.

\* Refer to the relationship between evaluation items and class subjects described in Sheet 3.

\* Refer to the curriculum map in Sheet 4.

## 9 Graduation thesis (graduation research) (meaning, student allocation, timing, etc.)

### Purpose

To enable students, through a topic of research, to acquire the capabilities for identifying something new, and solving problems based on a scientific point of view, required for comprehensively understanding pharmaceutical knowledge and contributing to the medical realm, as well as the attitude to endeavor to improve their capabilities throughout their lives.

Students present the results of their research at the graduation thesis presentation assembly that is held in the middle of December in the sixth year.

### Overview

#### 1. Attitude required for research activity

Students are expected to understand the basic philosophy and attitude required for joining in research activities in the future.

#### 2. Studying research activity

Students are expected to experience a series of research processes to achieve the aims of the research, and to acquire the basic knowledge, skills, and attitude required for research activities, in order to become capable of performing research by themselves in the future.

#### 3. Encounter with undiscovered things

Students are expected to experience pleasure in research activities that consists of the joy of invention and discovery in their own research.

### Student allocation timing and method

Students are allocated to the laboratory in the second semester of the third year. The allocation method and requirements are defined separately.

## 10 Responsibility

### (1) Responsibility for PDCA (plan, do, check, and act) cycle

The faculty committee of the Program of Pharmaceutical Sciences (head: Takuya Kumamoto (who is in charge of educational affairs)) is engaged in the processes of "plan" and "do."

For the processes of "check" and "act", the dean of the school consults with the responsible committee and carries out the required actions while taking the results of consultations into consideration.

## (2) Evaluation of the program

### Perspectives for evaluation of the program

This program is evaluated from the perspectives of "educational effectiveness" and "social effectiveness." The "educational effectiveness" is evaluated by the effects of implementation of the program on the educational achievement of students, based on such things as evaluation scores, evaluation of achievement, and GPA. The "social effectiveness" is evaluated by the social effectiveness of the program.

### Evaluation method (also describes relation to class evaluation)

In this program, achievement in the program is evaluated from the perspectives described above for students in the second semester of the sixth year. Also, it is evaluated for each year, taking evaluation by students into consideration by conducting questionnaires for students to evaluate the program each semester.

The "educational effectiveness" is comprehensively evaluated based on such things as the evaluation scores, evaluation of achievement, and GPA of the students who took the program.

The "social effectiveness" is evaluated based on such things as the rate of employment in hospitals, pharmacies, corporations (such as pharmaceutical companies) and public offices that have a close connection with the contents of this program. We regularly request a member of human resources staff in an organization that employs mainly students of this program to evaluate the program. In addition, we request graduates of this program to evaluate their own achievement and that of the program.

### Policy and method for feedback to students



Program of Pharmaceutical Sciences

Type	Subject type	Lesson Style	Required No. of credits	Class subjects, etc.	No. of credits	Type of course registration	Year in which the subject is taken																				
							1st grade		2nd grade		3rd grade		4th grade		5th grade		6th grade										
							Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall									
Specialized Education Subjects	Basic Specialized Subjects	Lecture	43	Practical English for Pharmaceutical Students	2	Required																					
				Introduction to Pharmaceutical Sciences	2																						
				General Chemistry	2																						
				Pharmaceutical Analysis	2																						
				Nuclear Pharmacy	2																						
				Organic Chemistry I	1																						
				Organic Chemistry I	1																						
				Biochemistry I	2																						
				Biochemistry II	2																						
				Biological Chemistry III	2																						
				Public Health Chemistry I	2																						
				Basic Kampo Medicine	2																						
				Microbiology	2																						
				Public Health Chemistry II	2																						
				Pharmaceutical Physical Chemistry	2																						
				Bio-Analytical Science	2																						
				Natural Products Chemistry	2																						
				Biological Chemistry IV	2																						
				Biopharmaceutics	2																						
				Biochemistry V	2																						
				Organic Chemistry	1																						
				Organic Chemistry	1																						
				Pharmacology I	2																						
	AnOutline of Pathology	1																									
	Total (Basic Specialized Subjects)				43			4	10	16	12			1													
	Specialized Subjects	Seminar	4	Japanese Pharmacopoeia	2	Required																					
				Research Practice	1																						
				Research Practice	1																						
			(2)	Practice for clinical food science	2	Free elective							2														
			Total (Seminar)			6					1	1	2					2									
		Lecture	(2)	Clinical food science	2	Free elective								2													
			62	Herbal medicine & Kampo medicine	2	Required																					
				Pharmacokinetics	2																						
				Biochemistry VI	2																						
				Biophysical Chemistry	2																						
				Antibiotics and Drug resistance	2																						
				Physiological Chemistry	2																						
				Organic Chemistry III	2																						
				Medicinal Organic Chemistry	2																						
				Pharmacology II	2																						
				Industrial Pharmaceutics	2																						
				Cell Motility	2																						
				Genetic Engineering	2																						
				Organic Chemistry IV	2																						
				Public Health Chemistry III	2																						
				Biological Statistics	2																						
Pharmacology III				2																							
Pharmacology I				2																							
Clinical Pharmacy	2																										
Clinical Medicine and Pharmacotherapy I	2																										
Pharmacotherapy A	2																										
AnOutline of Immunology	2																										



Type	Subject	type	Lesson	Style	Required					
	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall

Academic achievements of Pharmaceutical Sciences Program  
Relationships between the evaluation items and evaluation criteria

Academic achievements			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Knowledge and Understanding	(1)	To have a wide range of knowledge of liberal arts as well as basic understanding and knowledge of natural science and social science.	1. Being able to clearly explain from medical point of view about general education subjects along with natural science and social science. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to clearly explain about general education subjects along with natural science and social science. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain about general education subjects along with natural science and social science. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(2)	The basic knowledge and understanding of basic structures, physical characters and reaction of medicine and other inorganic and organic compounds.	1. Being able to explain clearly from medical point of view about the basic structure, physical characteristics and reaction of medicine and inorganic and organic compounds. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to explain clearly about the basic structure, physical characteristics and reaction of medicine and inorganic and organic compounds. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain about the basic structure, physical characteristics and reaction of medicine and inorganic and organic compounds. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(3)	Knowledge and understanding of the biological maintenance system of homeostasis and the ability to adjust to the environment.	1. Being able to clearly explain from medical point of view about maintenance mechanism of ecosystem homeostasis and dynamic adjustment. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to clearly explain about maintenance mechanism of ecosystem homeostasis and dynamic adjustment. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain about maintenance mechanism of ecosystem homeostasis and dynamic adjustment. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(4)	understanding about proper drug treatment for major diseases related to various organ.	1. Being able to comprehensively explain appropriate medication to major diseases relating to various organs from medical point of view. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to comprehensively explain appropriate medication to major diseases relating to various organs. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain appropriate medication to major diseases relating to various organs. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(5)	Understanding concerning preservation of the eco system and life environment, causes of environmental pollutants, and their influences on humans.	1. Being able to explain from medical point of view about ecosystem, preservation of living environment, components of environmental contamination, and human effects. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to clearly explain about ecosystem, preservation of living environment, components of environmental contamination, and human effects. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain from about ecosystem, preservation of living environment, components of environmental contamination, and human effects. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(6)	Knowledge and understanding about rational analyses of pharmacokinetics in order to to understand effects.	1. Being able to comprehensively explain from medical point of view about the logical analysis of pharmacokinetics to understand medical effects and	1. Being able to comprehensively explain the logical analysis of pharmacokinetics to understand medical  2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain the logical analysis of pharmacokinetics to understand medical effects and  2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(7)	The knowledge and understanding of communication with medical teams relating to medication.	1. Being able to make communication with other medical staff on medication as a member of medical team. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to make communication with other medical staff on medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain to other medical staff on medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.

Academic achievements			Evaluation criteria			
Evaluation items			Excellent	Very Good	Good	
Knowledge and Understanding	(8)	Improving English comprehension to chemical English.	The level of achievement will be assessed based on a formula that includes the average points calculated based on the student's TOEIC score and an evaluation in class. 80% is minimum.	The level of achievement will be assessed based on a formula that includes the average points calculated based on the student's TOEIC score and an evaluation in class. 70% is minimum.	The level of achievement will be assessed based on a formula that includes the average points calculated based on the student's TOEIC score and an evaluation in class.	
	(9)	The ability of considering basic pharmacological effects of medicine to chemical structure.	1. Being able to explain basic medical effects relating to chemical structures of medicine. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to enumerate and explain basic medical effects and chemical structures of medicine. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain basic medical effects and chemical structures of medicine. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	
	(10)	major diseases from aberration of clinical test values.	1. Being able to enumerate and explain major diseases assumed from abnormal clinical scores. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to enumerate and explain basic points of major diseases assumed from abnormal clinical scores. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain basic points of major diseases assumed from abnormal clinical scores. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	
Abilities and Skills	(1)	Abilities of collecting necessary information of drug treatment her/him self.	1. Being able to collect necessary information on medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to enumerate and explain basic points necessary for medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain basic points necessary for medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	
	(2)	Being able to search for toxic doses, targeted organs, symptoms of poisoning, emergency procedure and detoxication of chemical substances.	1. Being able to explain and search for measures on poisoning, targeted organs, poisoning symptoms, emergency treatments and detoxification of chemical substances. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to search for measures on poisoning, targeted organs, poisoning symptoms, emergency treatments and detoxification of chemical substances. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain search measures on poisoning, targeted organs, poisoning symptoms, emergency treatments and detoxification of chemical substances. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	
	(3)	coping to reduce harmful effects(side effects) of madicine.	1. Being able to enumerate basic matters relating to measures to decrease harmful effects (side effects) of medicine and conduct ways of solution. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to enumerate basic matters relating to measures to decrease harmful effects (side effects) of medicine and explain ways of solution. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to enumerate basic matters relating to measures to decrease harmful effects (side effects) of medicine and explain them. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	
	(4)	To be able to handle major analysis methods written in the Japanese Pharmacopoeia.	1. Being able to construct experimental ways and analyze representative official medicine of Japanese Pharmacopoeia. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to analyze representative official medicine of Japanese Pharmacopoeia. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to analyze representative official medicine of Japanese Pharmacopoeia. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	
	(5)	Using available compounds as starting materials, to be able to handle organic synthesis in order to chemically transform medicine into a target substance.	1. Being able to plan organic synthesis to have chemical conversion into desired compounds including medicine from compounds hard to get and synthesize them. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to conduct organic synthesis to have chemical conversion into desired compounds including medicine from compounds hard to get. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	synthesis to have chemical conversion into desired compounds including medicine from compounds hard to get. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.	

Academic achievements			Evaluation criteria		
Evaluation items			Excellent	Very Good	Good
Abilities and Skills	(6)	Using available compounds as starting materials, to be able to handle organic synthesis in order to chemically transform medicine into a target substance.	1. Being able to plan organic synthesis to have chemical conversion into desired compounds including medicine from compounds hard to get and synthesize them. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to conduct organic synthesis to have chemical conversion into desired compounds including medicine from compounds hard to get. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	synthesis to have chemical conversion into desired compounds including medicine from compounds hard to get. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(7)	Ability and skills to measure drug blood level concerning major drugs.	1. Being able to construct experiment plan to measure representative drug blood level and measure them. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to measure representative drug blood level. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	measure representative drug blood level. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(8)	The ability and skills of communication with medical teams relating to medication.	1. Being able to make communication with other medical staff on medication as a member of medical team. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to make communication with other medical staff on medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain to other medical staff on medication. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(9)	The ability and skills to appropriately deal with contraindication or inappropriate treatments of medicine.	1. Being able to appropriately deal with contraindications or inappropriate prescription of medicine by themselves. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to appropriately deal with contraindications or inappropriate prescription of medicine. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to explain appropriate measures to contraindications or inappropriate prescription of medicine. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
Attitudes	(1)	Self-betterment of character formation as a medical professional : the appropriate action and attitude being aware of that a pharmacist is a professional relating to human life. The knowledge and understanding to have communication not only with ailing people but with other medical staff in a medical team.	1. Being aware that a pharmacist is a professional relating to human life, being able to have an attitude to take the appropriate mind and make appropriate communication not only with ailing people but with patients and other medical staff as a member of a medical team. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being aware that a pharmacist is a professional relating to human life, Bing able to have an attitude to take the appropriate mind and make communication not only with ailing people but with patients and other medical staff as a member of a medical team. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being aware that a pharmacist is a professional relating to human life, having had an attitude to take the appropriate mind and make communication not only with ailing people but with patients and other medical staff as a member of a medical team. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(2)	Ability to be a pharmacist who is relied on not only by a medical team but also by citizens; the ability to be considerate of patients.	1. Being able to always keep the existence of patients and take action to become a reliable pharmacist not only from medical teams but also from national people. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to always keep the existence of patients and try to take action to become a reliable pharmacist not only from medical teams but also from national people. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to always keep the existence of patients and explain necessary matters to become a reliable pharmacist not only from medical teams but also from national people. 2. The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.

Academic achievements		Evaluation criteria		
Evaluation items		Excellent	Very Good	Good
(1)	Comprehensive problem-solving ability and educational ability: Concerning the influences caused by numerous chemical substances existing on the earth, to be able to analyze and argue about the survival of the human race. Also, to have the ability and skills to give instruction to youth.	1. Being able as a pharmacist or medical researcher to analyze effects of various kinds of chemical substances on earth to humans, generally estimate ways of survival of humans, actively try to find the solution of the issues and advise the next generation. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able as a pharmacist or medical researcher to analyze effects of various kinds of chemical substances on earth to humans and try to find solution for survival of humans, and advise the next generation. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	medical researcher to analyze effects of various kinds of chemical substances on earth to humans and try to find solution for survival of humans, and being able to advise the next generation. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	Self-betterment of character formation as a medical professional : the appropriate action and attitude being aware of that a pharmacist is a professional relating to human life.	1. Being aware that a pharmacist is a professional relating to human life, being able to have an attitude to take the appropriate mind and make appropriate communication not only with ailing people but with patients and other medical staff as a member of a medical team. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being aware that a pharmacist is a professional relating to human life, Bing able to have an attitude to take the appropriate mind and make communication not only with ailing people but with patients and other medical staff as a member of a medical team. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being aware that a pharmacist is a professional relating to human life, having had an attitude to take the appropriate mind and make communication not only with ailing people but with patients and other medical staff as a member of a medical team. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.
	(2) The knowledge and understanding to have communication not only with ailing people but with other medical staff in a medical team.			
(3)	The research ability: the ability to select issues to be solved in the professional field of pharmacist and carry out measures and research to solve the issues.	1. Being able to select issues to be solved in the professional area of pharmacist, plan the ways of solution by themselves and conduct the research. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 80%.	1. Being able to select issues to be solved in the professional area of pharmacist and conduct ways or research to solve the issues. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 70%.	1. Being able to conduct measures or research to solve issues to be solved in the professional area of pharmacist. 2.The learning attainment level is calculated as an average evaluation of grades based on designated formulae. The standard is more than 60%.

Role of liberal arts education in this major program





# Curriculum Map of Pharmaceutical Sciences Program

# Sheet 4

Academic achievements	1st grade		2nd grade		3rd grade		4th grade		5th grade		6th grade		
	Evaluation items		Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	
	To have a wide range of knowledge of liberal arts as well as basic understanding and knowledge of natural science and social science.		Liberal Arts Education Subjects GPA	Liberal Arts Education Subjects GPA	Peace Science Courses	Training of Physical Chemistry							
			Introduction to University Education	Area Courses									
			Area Courses	Introduction to Pharmaceutical Sciences									
			General Chemistry										
			Foundation Courses	Foundation Courses	Pharmaceutical Physical Chemistry	Basic Kampo Medicine	Biophysical Chemistry	Special laboratory Works in Pharmaceutical Sciences I				Japanese Pharmacopoeia	
			Organic Chemistry A	Organic Chemistry A	Nuclear Pharmacy( )	Training of Physical Chemistry	Medicinal Organic Chemistry	Special laboratory Works in Pharmaceutical Sciences					
			Organic Chemistry B	Organic Chemistry B	Bio- Analytical Science	Experiments in Organic Chemistry	Research PracticeA	Industrial Pharmaceutics	Pharmaceutical Affairs Related Laws				
			General Chemistry		Natural Products Chemistry	Organic Chemistry	Herbal medicine & Kampo medicine	Research PracticeB					
The basic knowledge and understanding of basic structures, physical characters and reaction of medicine and other inorganic and organic compounds.	quality				Organic Chemistry		Pharmacology III	Pharmacology IV					
			Foundation Courses	Foundation Courses	Biological Chemistry III	Pharmacology I	Physiological Chemistry	Cell Motility	AnOutline of Pathology	Clinical Pharmacology A		Clinical Pharmacology	Japanese Pharmacopoeia
				Biochemistry I	Biological Chemistry IV	Biochemistry V	Antibiotics and Drug resistance	Genetic Engineering	Research PracticePractice for P gchp	Pharmacology Practice for Clinical Pharmacy			
Knowledge and understanding of the biological maintenance system of homeostasis and the ability to adjust to the environment.	quality					Basic Kampo Medicine	Pharmacology III	Pharmacology IV	AnOutline of Pathology	Pharmacy Practice		Clinical Pharmacology	
									Pharmacotherapy A	Clinical Pharmacology A		Clinical Pharmacology	
									Clinical Pharmacy	Clinical Medicine and Pharmacotherapy III			
									Clinical Medicine and Pharmacotherapy I	Clinical Medicine and Pharmacotherapy II			
									AnOutline of Immunology				
									Pharmacotherapy B				
									Pharmaceutical Affairs Related Laws				
Fundamental knowledge understanding about proper drug treatment for major diseases related to various organ.	quality												
Understanding concerning preservation of the eco system and life environment, causes of environmental pollutants, and their influences on humans.	quality				Public Health Chemistry I								
					Public Health Chemistry II								
Knowledge and understanding about rational analyses of pharmacokinetics in order to to understand quantitatively madicinal effects or side effects.	quality					Pharmacology I	Research PracticeA	Research PracticeB	Clinical Pharmacy	Drug Informatics		Clinical Pharmacology	
						Biopharmaceutics	Pharmacokinetics	Public Health Chemistry III	Clinical Medicine and Pharmacotherapy I	Clinical Pharmacology A		Clinical Pharmacology	
						Basic Kampo Medicine		Biological Statistics	Pharmacotherapy B	Clinical Medicine and Pharmacotherapy II			
						Pharmacology II			Pharmaceutical Affairs Related Laws	Clinical Medicine and Pharmacotherapy III			
									Pharmacoeconomics				
									Clinical Pharmacy	Drug Informatics		Clinical Pharmacology	
									Clinical Medicine and Pharmacotherapy I	Clinical Pharmacology A		Clinical Pharmacology	
									Pharmacotherapy B	Clinical Medicine and Pharmacotherapy II			
									Pharmaceutical Affairs Related Laws	Clinical Medicine and Pharmacotherapy III	Knowledge of Clinical Pharmacy		
The knowledge and understanding of communication with medical teams relating to medication.	quality				Introduction to Pharmaceutical Sciences							Clinical Pharmacology	
												Clinical Pharmacology	
Improving English comprehension to acquire capacity of medical or chemical English.	quality												
The ability of considering basic pharmacological effects of medicine to chemical structure.	quality												
10 Abilities skills of citing speculated major diseases from aberration of clinical test values.	qualities								Pharmacotherapy A	Clinical Pharmacology A		Clinical Pharmacology	Japanese Pharmacopoeia
									Research PracticePractice for clinical food science	Clinical Medicine and Pharmacotherapy II		Clinical Pharmacology	
									Clinical food science	Clinical Medicine and Pharmacotherapy III			
									Clinical Pharmacy				
									Clinical Medicine and Pharmacotherapy I				
									Pharmacotherapy B				



## Curriculum Map of Pharmaceutical Sciences Program

# Sheet 4

[illegible]

# Curriculum Map of Pharmaceutical Sciences Program

# Sheet 4

Academic achievements		1st grade		2nd grade		3rd grade		4th grade		5th grade		6th grade	
Evaluation items	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	Spring semester	Fall semester	
Comprehensive problem-solving ability and educational ability: Concerning the influences caused by numerous chemical substances existing on the earth, to be able to analyze and argue about the survival of the human race. Also, to have the ability and skills to give instruction to youth. quality	Introductory Seminar for First-Year Students	Social Cooperation Courses			Research PracticeA	Special laboratory Works in Pharmaceutical Sciences I			Special laboratory Works in Clinical Pharmacy				
	Introduction to University Education	Introduction to Pharmaceutical Sciences				Special laboratory Works in Pharmaceutical Sciences			Special laboratory Works in Clinical Pharmacy				
	Social Cooperation Courses				Research PracticeB			Special laboratory Works in Clinical Pharmacy					
Self-betterment of character formation as a medical professional : the appropriate action and attitude being aware of that a pharmacist is a professional relating to human life. The knowledge and understanding to have communication not only with ailing people but with other medical staff in a medical team. quality	Introductory Seminar for First-Year Students	Social Cooperation Courses							Pharmacy Practice	Clerkship in Clinical Pharmacy			
	Information and Data Science Courses	Information and Data Science Courses								Clerkship in Clinical Pharmacy			
	Introduction to University Education	Introduction to Pharmaceutical Sciences											
	Social Cooperation Courses												
The research ability: the ability to select issues to be solved in the professional field of pharmacist and carry out measures and research to solve the issues. quality	Introductory Seminar for First-Year Students	Social Cooperation Courses	Nuclear Pharmacy( )	Experiments of Cellular and Molecular Biology	Research PracticeA	Special laboratory Works in Pharmaceutical Sciences I			Special laboratory Works in Clinical Pharmacy				
	Information and Data Science Courses	Information and Data Science Courses			Experiments of Public health Chemistry	Special laboratory Works in Pharmaceutical Sciences			Special laboratory Works in Clinical Pharmacy				
	Introduction to University Education	Introduction to Pharmaceutical Sciences			Experiments of Microbial Chemistry	Research PracticeB			Special laboratory Works in Clinical Pharmacy				
	Social Cooperation Courses												

Liberal Arts Education Subjects	Basic Specialized Subjects	Specialized Education Subjects	Graduation Thesis	Clerkship in Clinical Pharmacy	Required	Elective/required	Free elective
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- Fundamental qualities required for pharmacists
- Attitude as a pharmacist
- Viewpoint oriented to patients and ordinary citizens
- Communication skills
- Participation in team medical care
- Basic scientific knowledge and skills
- Practical capabilities regarding pharmacotherapy
- Practical capabilities for health and medical care in the local community
- Research ability
- Self-improvement
- Educational skills