

II Department of Pharmacy II

| Educational Purpose |

The purpose of the department is to nurture Christian experts who will serve society by cultivating research capabilities and creativity while profoundly pursuing the educational purpose of the university under the motto of truth, love, and service, based on the Korean educational philosophy of humanitarianism and the university's educational philosophy of Christian holistic education of intellect, spirit, and body.

| Educational Objectives |

1. To pursue profound truth inquiry based on the basic knowledge of life science and nurture competent pharmaceutical researchers and educators through the acquisition of research methods.
2. To produce high-quality research results by cultivating self-research skills.
3. To nurture leaders with character who contribute to the nation and society with the spirit of Christian service.
4. To nurture pharmacists who can prepare for the future by acquiring cutting-edge knowledge in the field of life science.

| Bylaws |

Article 1 (Majors)

The majors in this department include Medical Chemistry, Pharmaceutical Biochemistry, Pharmaceutical Microbiology, Pharmaceutical Analysis, Pharmacognosy, Pharmacology, Pharmaceutics and Drug Delivery, Preventive Pharmacy, Pathophysiology, Clinical Pharmacy, Social and Administrative Pharmacy

Article 2 (Admissions)

Matters related to the admissions comply with the Graduate School Regulations and its Bylaws.

Article 3 (Curriculum)

- ① The required major courses for master's program are Pharmacy Seminars I and II. The required major courses for doctoral program are Special Research I, II, and III. The required major courses for integrated program are Pharmacy Seminar I, II, and Special Research I, II, and III.
- ② The courses in other departments that are closely related to this department

can be recognized up to 9 credits.

Article 4 (Credits and Graduation Requirements)

The Students must complete the coursework according to the curriculum and earn the required number of credits. Also, students must obtain the qualification for submitting the thesis/dissertation by passing a foreign language test and comprehensive examination and pass the thesis/dissertation review. Credits are divided into course credits obtained by completing courses and thesis research credits obtained by performing research tasks suggested by the advisor.

- ① For the master's program, students must earn at least 3 credits of common essential courses, 2 credit of required major courses, and 21 credits of elective major courses.
- ② For the doctoral program, students must earn at least 6 credits of common essential courses, 6 credits of required major courses, and 27 credits of elective major courses.
- ③ For the M&D combined program, students must earn at least 6 credits of common essential courses, 8credits of required major courses, and 45 credits of elective major courses. (However, the credits earned with the master's thesis, if approved by the advisor, can be acknowledged as an achievement equivalent to the dissertation research.)
- ④ Common essential courses can be substituted with subjects designated by the department.

CourseWork	Master's Program (credits)	Integrated Program (credits)	Doctoral Program (credits)
Common Essential Courses	3	6	6
Required Major Courses	2	8	6
Elective Major Courses	21	45	27
Thesis/Dissertation	P	P	p
In Total	26	59	39

Article 5 (Forgien Language Test)

Matters related to the foreign language test comply with the Graduate School Regulations and its Bylaws.

Article 6 (Comprehensive Examination)

- ① Matters related to comprehensive examination comply with the Graduate School Regulations and its Bylaws.

- ② As for comprehensive examination subjects, students in the master's program select one subject from the his/her major courses, and students in the M&D combined program and doctoral program select two subjects from the major courses, with consult of their academic advisor.

Article 7 (Thesis/Dissertation)

- ① Matters related to the academic advisor and thesis/dissertations comply with the Graduate School Regulations and its Bylaws.
- ② The students pursuing the master's degree must pass the thesis review with the content of the thesis presented at a conference or published on a academic journal as the first author, or the content approved by the academic advisor.
- ③ The Students pursuing the doctoral degree (doctoral and M&D combined program) must publish one paper as the first author and the academic advisor as the corresponding author in an SCI-listed journal or an SCIE-listed journal with an impact factor of 1.0 or higher; or After publishing two papers in SCIE-listed journal with an impact factor less than 1.0. or four papers in academic journals registered with the National Research Foundation of Korea (NRF), one of the papers containing relevant contents must pass the dissertation review.

Article 8 (Committee of the Pharmacy Department of the Graduate School)

- ① Purpose: The Committee of the Pharmacy Department of the Graduate School is established to comprehensively review important matters related to the operation of the Graduate School and important matters of the Pharmacy Department.
- ② Composition: The Committee of the Pharmacy Department of the Graduate School is composed of the department chair and department professors, and the department chair acts as the chairperson.
- ③ Term of Office: The term of office of the chairperson is consistent with the term of office of the department chair.
- ④ Function: The Committee of the Pharmacy Department of the Graduate School discusses, deliberates, and decides on the following matters.
1. Matters concerning the establishment and revision of educational objectives
 2. Organization and revision of the department's curriculum
 3. Planning and execution of academic activities for graduate students
 4. Matters related to the admission and graduation
 5. Matters related to thesis/dissertation guidance

6. Appointment of thesis/dissertation advisors and reviewers
 7. Matters concerning foreign language test and comprehensive examination
 8. Selection of scholarship recipients
 9. Matters concerning department budget
- ⑤ Meetings: The committee is convened by the chairperson when the chairperson deems it necessary, and the meeting of the committee is opened with the attendance of a majority of the members present, and resolutions are made with the consent of a majority of the members present. The chairperson has the same voting rights as the members.

Article 9 (Student Council)

The student council of the Department of Pharmacy, an autonomous organization that promotes research and cooperation among students, can be organized.

Article 10 (Mutatis Mutandis)

Matters not specifically stipulated in these bylaws comply with the Graduate School Regulations.

| **Addenda** |

These Bylaws may be amended at a committee meeting of the Pharmacy Department of the Graduate School to reflect academic development and curriculum reorganization. Matters not stipulated in these Bylaws shall be determined by the committee meeting.

| Curriculum |

「Required Courses」

Course No.	Course Title	Credits
2000371	논문작성법 (Research Method)	2
2000957	약학세미나 I (Seminar in Pharmacy I)	1
2000956	약학세미나 II (Seminar in Pharmacy II)	1
2001433	특수연구 I (Directed Research I)	2
2001434	특수연구 II (Directed Research II)	2
2001435	특수연구 III (Directed Research III)	2
2002380	논문 (Thesis for Master of Science)	P
0000000	논문 (Dissertation for Ph.D. in Pharmacy)	P

「Elected Courses」

Common

Course No.	Course Title	Credits
2002908	성경과면역(Immune System in the Bible)	3

Medical Chemistry

Course No.	Course Title	Credits
2001077	유기화학특론 (Advanced Organic Chemistry)	3
2000159	고급의약품화학 (Advanced Medicinal Chemistry)	3
2001201	입체화학 (Stereochemistry)	3
2001729	천연물전합성 (Total Synthesis of Natural Product)	3
2001730	복소환화학 (Heterocyclic Chemistry)	3
2002103	화학요법제 1 (Cemotherapeutics 1)	3
2002104	화학요법제 2 (Cemotherapeutics 2)	3
2002105	유기약품합성화학특론 1 (Advanced Organic Drug Synthetic Chemistry 1)	3
2002106	유기약품합성화학특론 2 (Advanced Organic Drug Synthetic Chemistry 2)	3
2002107	생유기화학 1 (Bioorganic Chemistry 1)	3
2002108	생유기화학 2 (Bioorganic Chemistry 2)	3
2002109	약물구조활성관계 1 (Drug Structure Activity Relationship 1)	3
2002110	약물구조활성관계 2 (Drug Structure Activity Relationship 2)	3

Pharmaceutical Biochemistry

Course No.	Course Title	Credits
2000703	생화학특론 1 (Advanced Biochemistry 1)	3
2000704	생화학특론 2 (Advanced Biochemistry 2)	3
2001731	효소학 (Enzymology)	3
2001732	단백질화학 (Chemistry of Protein)	3
2000522	병태생화학 (Pathobiochemistry)	3
2001733	물리생화학 (Physical Biochemistry)	3
2000153	고급생화학실험법 (Methods for Biochemical Research)	3
2000422	면역학특론 (advanced Immunology)	3
2001737	종양학 (Oncology)	3
2000791	세포면역학 (Cellular Immunology)	3
2000572	분자면역학 (Molecular Immunology)	3
2001148	인체질환생화학특론 1 (Advanced Biochemistry of Human Diseases 1)	3
2001147	인체질환생화학특론 2 (Advanced Biochemistry of Human Diseases 2)	3
2001144	인체면역학특론 1 (Advanced Immunology of Human 1)	3
2001145	인체면역학특론 2 (Advanced Immunology of Human 2)	3
2000576	분자생화학 (Molecular Biochemistry)	3
2001742	고급단백질화학 (Advanced Protein Chemistry)	3
2002137	고급물리생화학 (Advanced Physical Chemistry)	3
2002138	실험동물학개론 (Introduction to Experimental Animal Science)	3
2001423	통계자료분석 (Statistical Data Analysis)	3
2001747	효소학특론 (Advanced Enzymology)	3
2000517	병태생화학특론 (Advanced Pathobiochemistry)	3
2001175	임상면역학 (Clinical Immunology)	3
2000686	생물면역학 (Immunobiology)	3
2001760	사이토카인 (Chemistry of Cytokines)	3
2002872	바이오의약품학 1 (Biopharmaceuticals 1)	3
2002920	바이오의약품학 2 (Biopharmaceuticals 2)	3

Pharmaceutical Microbiology

Course No.	Course Title	Credits
2000575	분자생물학특론 (Advanced Molecular Biology)	3
2000485	미생물학특론 1 및 실험 (Advanced Microbiology 1 and Lab.)	3
2000486	미생물학특론 2 및 실험 (Advanced Microbiology 2 and Lab.)	3
2000499	바이러스학특론 (Advanced Virology)	3
2001478	항생물질화학특론 (Advanced Antibiotics Chemistry)	3
2000516	병원미생물학특론 (Pathogenic Microbiology)	3
2000786	세균학특론 (Advanced Bacteriology)	3
2000489	미생물학특론 1 (Advanced Microbiology 1)	3
2000488	미생물학특론 2 (Advanced Microbiology 2)	3
2001345	진균학 (Mycology)	3
2001261	전염병학 (Infection Diseases)	3
2000794	세포생물학특론 (Advanced Cell Biology)	3
2000685	생물공학특론 (Advanced Biotechnology)	3
2001761	공업미생물 (Industrial Microbiology)	3
2001346	진단미생물학 (Diagnostic Microbiology)	3

Pharmaceutical Analysis

Course No.	Course Title	Credits
2001740	고급기기분석 1 (Advanced Instrumental Analysis 1)	3
2001741	고급기기분석 2 (Advanced Instrumental Analysis 2)	3
2000955	약품분석특론 (Advanced Pharmaceutical Analysis)	3
2000958	약학분광학 (Spectroscopy in Pharmacy)	3
2001124	의약품제제분석 (Analysis of Pharmaceutical Preparation)	3
2001364	천연물분리분석 (Separation Method of Natural Products)	3
2001746	유기화합물구조분석 (Structural Analysis of Organic Compounds)	3
2001122	의약품 품질관리 (Quality Control for Drug)	3
2000186	공정시험법 (Official Analysis)	3
2001757	신약분석 (Analysis of New Drug)	3
2001758	자동분석 (Automatic Analysis)	3
2001759	생체시료분석 (Analysis of Biological Samples)	3
2001762	약품통계학 (Pharmaceutical Statistics)	3
2001763	약품분석계기학 (Instrumentation in Pharmaceutical Analysis)	3

Pharmacognosy

Course No.	Course Title	Credits
2000953	약용식물분류학 (Medicinal Plants Taxonomy)	3
2000848	식물조직배양학특론 (Advanced Plant Tissue Culture)	3
2001362	천연물화학특론 1 (Advanced Natural Products Chemistry 1 & Lab)	3
2001363	천연물화학특론 2 (Advanced Natural Products Chemistry 2 & Lab)	3
2000680	생리활성연구론 (Methodology of Bioactive Natural Products Lab)	3
2001736	천연물생합성특론 (Advanced Natural Products Biosynthesis)	3
2001368	천연약물자원학 (Natural Resources of Drug)	3
2000941	알칼로이드화학 및 실험 (Alkaloid Chemistry & Lab)	3
2000508	배당체화학 및 실험 (Glycoside Chemistry & Lab)	3
2001476	한약학특론 1 (Advanced Herbal Medicines 1)	3
2001477	한약학특론 2 (Advanced Herbal Medicines 2)	3
2000007	Alkaloid 화학특론 (Advanced Alkaloid Chemistry)	3
2000954	약용천연물질연구법 (Methods in Studies of Natural Products Medicine)	3
2001365	천연물약품세미나 (Seminar in Natural Products)	3
2001474	한약방제학특론 1 (Advanced Herbal Prescription 1)	3
2001475	한약방제학특론 2 (Advanced Herbal Prescription 2)	3
2000601	사상의약학세미나 (Research of Sasang Constitutional Medicine)	3
2000105	건강기능성식품학특론 (Advanced Health Functional Foods)	3
2001754	식물바이오테크놀로지 (Plants Biotechnology)	3
2001756	고급약용식물분류학 (Chemotaxonomy of Medicine Plants)	3
2002140	한약제제론 (Topics in Crude Drug Preparation)	3
2001265	전통약물연구법 (Research of Traditional Medicine)	3

Pharmaceutics and Drug Delivery

Course No.	Course Title	Credits
2001281	제제학 특론 (Advanced Industrial Pharmacy)	3
2001279	제제설계론 (Drug Design)	3
2000688	생물약제학 특론 (Advanced Biopharmaceutics)	3
2001123	의약품생체이용률 (Bioavailability of Medicine)	3
2001287	조제학 특론 및 세미나 (Advanced Dispensing Pharmacy & Seminar)	3
2000947	약물상호작용론 (Drug Interaction)	3
2000145	고급 조제학 1 (Advanced Pharmaceutical Dispensing 1)	3
2002111	고급조제학 2 (Advanced Pharmaceutical Dispensing 2)	3
2000144	고급 제제학 1 (Advanced Pharmaceutical Preparation 1)	3
2000162	고급제제학 2 (Advanced Pharmaceutical Preparation 2)	3
2000161	고급제제설계론 (Advanced Drug Design)	3
2000152	고급생물약제학특론 (Advanced Biopharmaceutics)	3
2002112	제제의 생체이용률 (Bioavailability of Pharmaceutical Preparation)	3
2002113	약물송달체제 (Drug Delivery System)	3

Pharmacology

Course No.	Course Title	Credits
2000950	약물학특론 1 및 실험 (Advanced Pharmacology 1 & Lab)	3
2003342	약리학특론 1 및 실험 (Advanced Pharmacology 1 & Lab)	3
2000951	약물학특론 2 및 실험 (Advanced Pharmacology 2 & Lab)	3
2003343	약리학특론 2 및 실험 (Advanced Pharmacology 2 & Lab)	3
2000675	생리학특론 1 및 실험 (Advanced Physiology 1 & Lab)	3
2000676	생리학특론 2 및 실험 (Advanced Physiology 2 & Lab)	3
2000871	신경생리학 1 및 실험 (Neurophysiology 1 & Lab)	3
2002519	신경독성학 1 및 실험(Neurotoxicology & Laboratory)	3
2002521	신경약리학 1 및 실험 (Neuropharmacology & Lab)	3
2001592	약물통계학 및 실험 (Pharmacological Statistics)	3
2003345	약리통계학 및 실험 (Pharmacological Statistics)	3
2001192	임상약물학 1 (Clinical Pharmacology 1)	3
2003459	임상약리학 1 (Clinical Pharmacology 1)	3
2000870	신경생리학 2 (Neurophysiology 2)	3
2002520	신경독성학 2 (Neurotoxicology 2)	3
2000873	신경약리학 2 (Neuropharmacology 2)	3
2001193	임상약물학 2 (Clinical Pharmacology 2)	3
2003460	임상약리학 2 (Clinical Pharmacology 2)	3
2001753	약물요법학 (Pharmacotherapeutics)	3
2000387	독성학 1 (Toxicology 1)	3
2000388	독성학 2 (Toxicology 2)	3
2000577	분자약물학 (Molecular Pharmacology)	3
2003349	분자약리학 (Molecular Pharmacology)	3
2000332	내분비학특론 (Advanced Endocrinology)	3
2001603	약물동력학 (Pharmacokinetics)	3
2000949	약물수용체론 (Theory on Drug Receptor)	3
2000865	신경과학연구방법론 (Methods for Neuroscience Research)	3
2002522	약물학연구방법론 (Methods for Pharmacology Research)	3
2003352	약리학연구방법론 (Methods for Pharmacology Research)	3
2000386	독성연구방법론 (Methods for Toxicology Research)	3

Preventive Pharmacy

Course No.	Course Title	Credits
2001004	예방약학특론 I (Advanced Preventive Pharmacy I)	3
2001005	예방약학특론 II (Advanced Preventive Pharmacy II)	3
2001558	공중보건학특론 (Advanced Public Health)	3
2001728	산업위생학 (Industrial Hygiene)	3
2000857	식품위생학 (Food Hygiene)	3
2001734	산업독성학 (Industrial Toxicology)	3
2001735	환경위생학 (Environmental Hygiene)	3
2001604	환경질환 (Environmental Disease)	3
2000578	분자역학 (Molecular Epidemiology)	3
2001755	분자독성학 (Molecular Toxicology)	3
2000699	생체유해라디컬작용론 (Free Radicals in Biology and Medicine)	3
2001743	화학물질위해성 평가론 (Risk Assessment of Chemicals)	3
2001744	생체안전성연구법 (Methods in Biological Safety Evaluation)	3
2001745	발암 및 변이원성환경물질 (Carcinogenic and Mutagenic Toxicology)	3

Pathophysiology

Course No.	Course Title	Credits
2000519	병태생리학세미나 I (Pathophysiology Seminar I)	3
2000521	병태생리학세미나 II (Pathophysiology Seminar II)	3
2000792	세포병리학 (Cellular pathology)	3
2000912	실험병태생리학 (Experimental Pathophysiology)	3
2000420	면역병태생리학 (Immunological Pathophysiology)	3
2001452	피부질환병태생리학 (Pathophysiology on Skin Diseases)	3
2000520	병태생리학특론 (Advanced Pathophysiology)	3
2000574	분자병태생리학 (Molecular Pathophysiology)	3
2000987	염증학 (Inflammation)	3
2001311	종양병태생리학 (Tumor Pathophysiology)	3
2001515	환경 및 영양질환 (Environmental and Nutritional Diseases)	3
2001748	혈관질환 병태생리학 (Vascular Disease Pathophysiology)	3
2001749	호흡기질환 병태생리학 (Pathophysiology on Respiratory Diseases)	3
2001750	신경계 질환 병태생리학 (Neuropathophysiology)	3
2001751	내분비계 질환 병태생리학 (Pathophysiology on Endocrine Diseases)	3
2001752	소화기계 질환 병태생리학 (Gastroenterological Pathophysiology)	3

Clinical Pharmacy

Course No.	Course Title	Credits
2001573	약물치료학 특론 I (Advanced Pharmacotherapy I)	3
2001764	약물치료학 특론 II (Advanced Pharmacotherapy II)	3
2001765	의약정보학 특강 (Topics of Drug information)	3
2001766	임상병태생리학 (Clinical Pathophysiology)	3
2001767	임상약학 실습 I (Clinical Pharmacy Practice I)	3
2001768	임상약학 실습 II (Clinical Pharmacy Practice II)	3
2001769	임상 약물상호작용론 (Studies in Drug interaction)	3
2001194	임상약학 특론 (Studies in Clinical Pharmacy)	3
2001770	약물사용 안전관리 이론 (Medication Safety Management)	3
2001771	통계자료 분석(생물통계, 자료분석) (Biostatistics)	3
2001773	지역사회약국 약료 (Community Pharmacy Pharmacotherapy)	3
2001775	약학 실무 교육론 (Pharmacy practice education)	3
2001776	약료경영학 특강 (Topics of Managed care pharmacy)	3
2001779	상담이론(환자상담 이론과 실제) (Theory & Practice of Counselling for Patients)	3
2001783	약학연구방법론 (Pharmaceutical Research Methodology)	3
2001582	근거중심약료 특강 (Evidence Based Pharmacotherapy)	3
2002258	감염질환 약료학 (pharmacotherapy for Infection Diseases)	3
2002268	순환기 질환 약료학 (Pharmacotherapy for Cardiovascular Disease)	3
2002216	신장 및 비뇨기 질환 약료학 (Pharmacotherapy for Renal Urologic Disorders)	3
2002215	신장 및 비뇨기 질환 약료학 (Pharmacotherapy for Renal Urologic Disorders)	3
2002257	신경계 및 정신질환 약료학 (Pharmacotherapy for Neurologic and Psychiatric Disorders)	3
2001751	내분비계 질환 약료학 (Pharmacotherapy for Endocrinology Diseases)	3
2002269	산부인과 질환 약료학 (Pharmacotherapy for Gynecologic and Obstetric Disorder)	2
2002270	이식및면역학적질환약료학 (Pharmacotherapy for Transplant Patients and Immunologic Disorder)	2
2002271	혈액/종양학적 질환 약료학 (Pharmacotherapy for Hematology/Oncology Disorder)	3
2002272	호흡기 질환 약료학 (Pharmacotherapy for Respiratory Disorders)	2
2002273	소아 약료학 (Pediatric Pharmacotherapy)	2
2002274	안과 약료학 (Pharmacotherapy for Ophthalmic Disorder)	1
2002275	피부과 약료학 (Pharmacotherapy for Dermatologic Disorder)	1
2002276	비처방약물 약료학 I (Pharmacotherapy with Non-prescription Medication)	3
2002277	비처방약물 약료학 II (Pharmacotherapy with Non-prescription Medication)	3
2002213	임상연구방법론 I (Methodology for Clinical Research I)	3
2002256	임상연구방법론 II (Methodology for Clinical Research II)	3
2002278	고급임상실습 I (Advanced Clinical Practice I)	3
2002279	고급임상실습 II (Advanced Clinical Practice II)	3
2002280	임상실무교육방법론 (Methodology for Clinical Practice Education)	3
2002281	약물효과예측도구개발 (Development of Tool for prediction of Pharmacotherapy Outcomes)	2
2002282	골격 및 근육질환 약료학 (Pharmacotherapy for the Skeletal and Musde Disorders)	3
2002283	임상문헌분석 및 평가 (Analysis and evaluation of Clinical Literatures)	3

Social and Administrative Pharmacy

교과목코드	과목명	학점
2003192	의약품경제성평가 (Pharmacoeconomics)	3
2003193	의약품경제성평가특론 (Advanced Pharmacoeconomics)	3
2002931	사회약학연구방법론 (Research Methodology in Social Pharmacy)	3
2003194	약물역학 (Pharmacoepidemiology)	3
2003195	체계적문헌고찰과 메타분석 (Systematic Review & Meta-Analysis)	3
2003196	보험약가정책론 (Pharmaceutical Pricing and Reimbursement Policy)	3
2003197	보건경제학 (Healthcare Economics)	3
2003198	건강보장론 (Health Insurance Policy)	3
2003199	약사와 약국의 역할 (Pharmacist & Pharmacy in Healthcare System)	3
2002996	의약통계자료분석론 (Fundamentals of Healthcare Data Analysis)	3
2003200	빅데이터자료분석론 (Data Manipulation and Analysis in Healthcare Big Data)	3
2002997	사회약학세미나 (Seminar in Social Pharmacy)	3
2003201	논문작성법 및 연구윤리 (Science Research Writing & Research Ethics)	3
2003202	약사관계법규 (Pharmaceutical Affairs Law)	3

| Course Information |

Research Method

Students study the system and format required for writing a dissertation and develop literature research methods, analysis techniques, expressive skills, etc., and study methods for logically unfolding the originality of research.

Seminar in Pharmacy I, II

Students will present recent research trends, research projects and individual subjects in Pharmacy or their thesis if they are in the last semester. It includes Q&A and discussion about research prospects in their field.

Directed Research I, II, III

Students are expected to make a presentation about related research trends, research subjects or your thesis if you are in the last semester. It may include Q&A and discussion about research prospects in your field.

Immune System in the Bible

In the course of studying the body's immune system, the purpose is to understand and learn the immune response and its composition through God's providence of creation through the Bible and the immune response in charge of the body's defense function. Therefore, it is necessary to understand the mechanism of immunity, the primary mechanism of the host's immune response, and to learn the application of immunotherapeutic agents to explain and utilize the relationship with bio-immunity.

Advanced Principle of Health and Therapy

The aim of this course derives from the health perspectives of biblical Christianity and is to prepare health professionals to serve and transform society through evidence-based health promotion and Bible-based lifestyle principles. This course also considers that health, disease, and healing dynamics are determined to a large extent by God's moral and natural laws. The laws by Jesus Christ brings healing and transformation of lifestyles for higher quality of life.

Advanced Preventive Pharmacy I, II

This course will provide general knowledge of toxicokinetics, mechanisms of actions, and toxicological evaluation of environmental chemicals in various media including foods, air, and drugs. Furthermore, risk assessment, which is the process of quantifying the probability of a harmful effect to individuals or populations exposed to certain chemicals, will be discussed in the context of public health

Advanced Public Health

Introduction to the basic concepts and principles of public Health. Study of the concepts of preventive medicine, causes of diseases, and the history of public health.

Industrial Hygiene

This course will focus on the study of diseases, health disorders, and well-being caused by various hazardous environmental pollutants exposed in the workplace and will provide the knowledge of management of the work environment and stress that cause serious discomfort and efficiency.

Pathophysiology Seminar I, II

Presentations on research trends, research tasks or special topics related to recent diseases are held, and topical discussions are held on Q&A and research prospects.

Advanced Organic Chemistry

In this course, students will learn organic chemistry with the level higher than what they learned in the undergraduate program.

Advanced Medicinal Chemistry

In this course, students will learn structure-activity relationship, economical synthetic methods, knowledge and technology for new drug development.

Stereo-chemistry

In this course, students will learn nomenclature of stereoisomers, differences of their physical and chemical properties, influences of stereochemistry on their reactivity, pharmacological activity of stereoisomers, and optimal and practical application of stereochemistry.

Total Synthesis of Natural Product

In this course, students will learn synthetic methods of natural chemicals. through this course students also learn important organic reactions for the organic synthesis, and learn how to apply those reactions for the development of new drugs.

Heterocyclic Chemistry

Many drugs have heterocyclic rings. In this course, students will learn physical, chemical and biological properties of heterocyclic compounds and how to synthesize them, and how to apply these knowledge for the development of new drugs.

Cellular pathology

From the pathophysiological point of view, this course cultivates the ability to understand the causes of diseases, developmental mechanisms, and clinical significance at the cellular level.

Experimental Pathophysiology

Research methods for developing in vivo and in vitro research models to identify pathological mechanisms of diseases are studied.

Immunological Pathophysiology

Cultivate the ability to study the molecular immunological characteristics of immune and hypersensitivity reactions, the experimental pathophysiological model construction method needed to develop immunomodulators, and the development method of therapeutic agents.

Advanced Biochemistry 1

Current research is discussed on the metabolism of lipids and cell membranes, the structure of proteins and their particular systems and roles in the human body, and the metabolism of carbohydrates and the functions of their metabolites.

Advanced Biochemistry 2

Studies focus on the production and metabolism of amino acids and the structure and metabolism of glucose, lipid, and protein to gain the energy and essential metabolite.

Enzymology

It studies the structure and action of enzymes, factors that affect enzyme action, enzyme mechanisms, enzyme kinetics, activation and inhibition of enzymes, and metabolic control functions of enzymes.

Chemistry of Protein

It deals with proteomics contents that acquire pure separation and analysis methods of proteins and apply state-of-the-art protein analysis chemistry using the technique.

Pathobiochemistry

The causes of errors in biochemical mechanisms of various diseases and the relationship between standard mechanisms in metabolic reactions in vivo and disease-causing mechanisms are identified, and fundamental and scientific disease treatment directions that can apply the mechanisms are learned.

Physical Biochemistry

Learn the basic knowledge based on physical chemistry on the types of experimental methods essential for biochemical research and the kinetics of the principles, and lecture on their application by adapting to the biochemical mechanisms in vivo.

Industrial Toxicology

To understand the toxicity and characteristics of gases, solvents, and dusts that industrial workers are exposed to at work place, and to study scientific approaches related to the establishment of acceptable standards for these

substances in the work environment.

Advanced Molecular Biology

This course will provide the knowledge of genetic materials present in the human body and the mechanism of replication and expression, control, and recombination of genetic materials

Methods for Biochemical Research

It learns the contents of various state-of-the-art technologies necessary for biochemical research through theory and experiments.

Advanced Microbiology 1 and Lab.

This course will provide the knowledge of basic characteristics of bacteria, virus and fungi and their molecular taxonomy.

Advanced Microbiology 2 and Lab.

This course will provide the knowledge of bacterial pathogenesis, antibiotic resistant and biological characteristics of microbial strains used in drug production.

Environmental Hygiene

This course will provide recent knowledge of indoor air comfort, pollution management, and water and sewage hygiene management.

Advanced Virology

This course will provide the microscopic structure of the virus, the relationship with the host cell, pathogenicity, and relationship with the human body.

Advanced Antibiotics Chemistry

This course will provide the properties of antibiotic-producing strains, the chemical structure of antibiotics, action mechanism of antibiotics and bacterial resistant mechanism against antibiotics.

Advanced Immunology

We are focusing on immunology based on pathology. We are also learning about the latest discoveries and mechanisms in the field of immunology. Finally, we are exploring and using future research possibilities based on our learning.

Pathogenic Microbiology

This course will provide the knowledge of virulence factors of microorganism and their action mechanisms in host.

Advanced Bacteriology

This course will provide the knowledge of bacterial structure, cellular components, metabolism, pathogenicity, and the mechanism of antibiotics

Natural Resources of Drugs

The purpose of this lecture is to develop the ability to develop more ideal

methods by lecturing on the scientific methods of collection, cultivation, and storage of herbal medicines that can be used as natural medicines.

Medicinal Plants Taxonomy

The purpose is to cultivate the ability to systematically discriminate them by examining and shape, composition, and other characteristics of each plant by actually encountering many plants through visiting herbal gardens, greenhouses, etc., or through field collection.

Advanced Medicinal Plant Tissue Culture

Learn how to cultivate plant cells, tissues, and organs, study the biosynthesis of important physiologically active substances and apply them to the development of mass production methods for trace elements.

Advanced Natural Product 1 and Lab.

Methods for isolating and identifying major compounds present in animals, plants and minerals, as well as pharmacological actions, biosynthetic pathways, and physical properties are lectured.

Advanced Natural Product 2 and Lab.

Research and classify the chemical components contained in foods, animals and minerals that have already been identified, understand their pharmacological actions and biosynthetic pathways, and learn about the isolation methods of new substances through theories and experiments.

Methodology of Bioactive Natural Product

Learn how to use natural compounds with physiological activity that can be used as anticancer drugs, anti-inflammatory drugs, antibiotics, and contraceptives in herbal medicine.

Advanced Natural Products Biosynthesis

Learn the biosynthetic pathways of primary and secondary metabolites in plants, enzymes and decomposition processes related to them, and study the classification according to the chemical structural characteristics of these biosynthetic substances.

Environmental Disease

This course will provide the harmful effects of various environmental pollutants, mechanisms of disease development of environmental pollutants, and how to prevent the exposure of pollutants

Alkaloid Chemistry and Lab.

The lecture has Distribution, chemical structure, biosynthesis, confirmation method, separation method, pharmacological activity, and test methods of alkaloids showing important physiological activities

Molecular Epidemiology

Molecular epidemiology is a branch of epidemiology and medical science that focuses on the contribution of potential genetic and environmental risk factors, identified at the molecular level, to the etiology, distribution and prevention of disease within families and across populations

Glycoside Chemistry and Lab.

Lectures are given on the physicochemical properties of glycosides, distribution in the plant kingdom, extraction and purification methods, molecular structure determination methods, biosynthetic pathways, and their identification methods.

Oncology

Students learn fundamental theories and techniques, from the primary mechanism of cell development to the development and metastasis of cancer cells, as well as the mechanism of action of anticancer therapies and anticancer drugs, their pharmacological characteristics, and their applications.

Cellular Immunology

Understanding and studying the human immune system, the etiology, mechanism, and symptoms of various immune diseases at the cell level, and the characteristics and applications of different immunohistologies for treatment and application using immune cells.

Neurophysiology 1 & Lab

Students can learn structures and function of the nerve and its modulation mechanism. It can help to improve understanding neuronal disease pathophysiology and therapeutic actions of drugs

Neurotoxicology 1 & Laboratory

This course provide information about neurotoxic chemicals such as physicochemical properties, toxicokinetic properties, how to prevent and detoxify toxication. It can help to improve toxicological knowledgment and research performance on this area.

Advanced Pharmacology 1(2) and Lab.

Students can learn physicochemical properties of drugs and physiological effects in this class.

Advanced Physiology 1(2) and Lab.

In this course, you can study functions of human organs and various mechanisms involved in the maintenance of the internal environments.

Pharmacal Oncology

The causes and stages of tumor development are studied biochemically.

Clinical Pharmacokinetics and Lab.

This course include drug structure, properties, absorption, metabolism, distribution, elimination and its clinical application.

Molecular Pharmacology

Students can improve research competency on physiology, pathophysiology and therapeutic techniques by discussing molecular pharmacological changes and mechanisms of drug actions.

Neuropharmacology 1 and Lab.

This course provides information about central nervous system in which relationship between neurotransmitter and receptors and about affecting drugs including mechanism of action, therapeutics, toxicity, drug interaction.

Neurotoxicology 2

This class provides in-depth knowledge about actions and mechanisms of neurotoxicants and its prevention and detoxification of toxication. Students should search and study about experimental methods to improve expertise in neurotoxicology.

Methods for Pharmacology Research

Based on basic knowledge about pharmacology, students will do research and experiment to study drug mechanism and its application.

Pharmacological Statistics

This class provides statistical theories and methods for analyzing the results of pharmacological experiments.

Advanced Industrial Pharmacy

The curriculum expects students to acquire new knowledge, integrate it, and apply it to various aspects of pharmaceutical studies, such as data analysis/interpretation, drug molecule characterization, and dosage form manufacturing and evaluation.

Dosage Form Design

This course is designed for learners to attain a thorough and unambiguous understanding of the logical formulation and utilization of drug products and preparations. This knowledge will assist them in developing logically sound explanations and arguments for their patients' drug therapy.

Biopharmaceutics

This course is designed to advance the development of Drug Delivery Systems (DDS) formulations by applying physical and chemical kinetics to study the pharmacokinetics of drugs in vivo, thereby enhancing drug efficacy and developing safe drug formulations. It deals with the development of DDS formulations by improving the process.

Bioavailability of Medicine

This course focuses on the principles underlying the processes of drug absorption, distribution, and elimination, and explores advancements in

pharmacokinetic modeling, data analysis methods, and other relevant topics. The application of these principles to the design of controlled release and targeted drug delivery systems is emphasized. The course also covers the assessment of bioavailability and bioequivalence for traditional pharmaceutical dosage forms and novel drug delivery systems, including biosimilars.

Advanced dispensing Pharmacy and Seminar

This course involves compounding one or more drugs to achieve the therapeutic goal through proper preparation, and studying the effects of drug combination, such as synergistic effects, to enable monitoring of prescription medication by healthcare providers. It provides education on monitoring prescriptions when compounded by a physician by researching the effects of drug combination.

Drug Interaction

The course focuses on studying drug interactions that occur when different drugs are mixed together during the formulation process. These interactions can affect the effectiveness of a drug and its properties, and may also cause toxicity. The primary goal of studying drug interactions is to promote safe drug use by preventing these changes and ensuring that patients receive the desired therapeutic effects without experiencing negative side effects.

Clinical Pharmacology I, II

It is based on general knowledge about drugs. Students will learn how to apply drugs in clinical practice and to solve problems that arise when they are applied.

Advanced Instrumental Analysis 1

Learn about the principles of instrumental analysis necessary for pharmaceutical analysis. In particular, learn the principles of spectrometry and spectrum analysis, and apply them to perform qualitative and quantitative analysis.

Advanced Instrumental Analysis 2

Learn about the principles of instrumental analysis necessary for pharmaceutical analysis. In particular, learn the principles of chromatography and the interpretation of chromatograms, and apply them to separate and analyze trace compounds.

Advanced Pharmaceutical Analysis

Based on the basic theory of analytical chemistry, it enables quantitative and structural analysis of trace compounds in addition to analysis of general pharmaceuticals. In addition, students develop theories and abilities to analyze biological samples.

Spectroscopy in Pharmacy

Learn the detailed principles of ¹H-NMR and ¹³C-NMR and structural analysis of 1D- and 2D-spectrum so that they can be applied to the structural analysis of pharmaceuticals.

Analysis of Pharmaceutical Preparation

Students learn the ability to develop selective and highly sensitive new analysis methods for target compounds in pharmaceuticals. Learn about the derivatization of the target component so that it is particularly suitable for analysis.

Pathophysiology on Skin Diseases

This course will review the pathophysiologic changes associated with a skin diseases, such as atopic dermatitis and acne, and the study about the mechanism and development of anti-atopic and anti-acne agent in skin immune system.

Advanced Biochemistry of Human Diseases 1

Education aims to learn the theory correctly and develop the ability to apply the principle to the biochemical area. In the 1st semester of the 1st year, the structure and function of proteins classified by chemistry, the structure, and function of hemoglobin, the theory of enzyme chemistry and cell membrane chemistry, glycolysis organized by the use of energy produced in the metabolic process, and energy Lectures on formation process, fat metabolism, amino acid metabolism, and photosynthesis.

Advanced Biochemistry of Human Diseases 2

In the second semester of the first year, 3) biosynthesis of cell membranes, fat components and steroid hormones, amino acid, and heme biosynthesis, and nucleotide biosynthesis in the biosynthesis of macromolecules in vivo, 4) chemical protein biosynthesis of DNA and RNA, and biosynthesis of DNA and RNA in the field of gene expression In the field of genetic factor expression and 5) molecular biology, lectures are given on immunoglobulin, bacterial cell membrane chemistry, and hormone action.

Advanced Immunology of Human 1

By examining the mechanism of the immune response as a defense function of living organisms at the level of various cells and molecules that make up the immune system, understanding the detailed regulatory mechanism of immune function is improved.

Advanced Immunology of Human 2

The unique topic of immunology helps to understand the basic structure of the immune system and the expression process of immune function. It delivers

in-depth knowledge about the types of immune system diseases such as allergies, AIDS, and autoimmune diseases, the causes of disease occurrence, and treatment and prevention.

Food Hygiene

This course will provide the causes and characteristics of various diseases that occur through food, knowledge of prevention methods and the knowledge of harmful microorganisms in food hygiene due to recent changes in dietary patterns.

Molecular Toxicology

In the course of molecular toxicology, students are learning about the toxicology of xenobiotics at the molecular level. In this course, metabolic activation (biotransformation) of xenobiotics, interaction of xenobiotics with genes, gene expression and signal transduction as well as the health effects caused by the series of the events.

Free Radicals in Biology and Medicine

Free radicals such as oxygen and carbon-centered radicals are generated endogeneously and/or exogeneously in humans. Due to their high reactivity with macromolecules including DNA, proteins, and lipids, they can damage cells and tissues, finally leading to various chronic degenerative diseases. This course will introduce the sources of free radicals generated in the cells and recent technology to detect free radicals, and provide a number of examples for toxic insults resulting from free radicals.

Molecular Biochemistry

1) Signal transduction system, 2) Posttranslational modification, 3) Hormone, and 4) secondary messengers are selected for in-depth investigation and discussion, including the mechanism of occurrence of incurable diseases that mankind is facing and recent topics related to research on their treatment.

Advanced Pathophysiology

Students can understand symptoms of abnormal physiological functions by learning causes and pathogenesis of diseases.

Molecular Pathophysiology

Students can do research on effective therapeutic methods of diseases by investigating pathogenesis through molecular biology techniques.

Advanced Protein Chemistry

Proteins are polymers that directly control life phenomena. Understand the structure of these proteins through practice through computer graphics. In addition, it is understood that the structure of the protein is closely related to its function of the protein. Therefore, understand the life phenomena

supervised by proteins through an understanding of the structure and function of these proteins.

Advanced Physical Chemistry

A living body is a material system subject to the physical-chemical law. A life phenomenon is a physical-chemical change in the material system called a living body. Physical chemistry is the study of understanding the structure and changes of substances that are the subject of chemistry based on physical laws. Therefore, studying physical chemistry is essential for understanding the structure and transformation of substances, including life phenomena. Through this lecture, it is necessary to study thermodynamics, material movement, reaction kinetics, quantum theory, and spectroscopy, which are areas of physical chemistry, and to understand the principle of experimental biochemical techniques based on physicochemical methods.

Molecular Immunology

The main content of this course is to understand the mammalian immune system through genetic, biochemical, cellular and molecular biological analysis.

Risk Assessment of Chemicals

The goal of chemical risk assessment is to have a full understanding of the nature, magnitude and probability of a potential adverse health or environmental effect of a chemical. It takes into account of both hazard and exposure. Risk assessment forms the foundation of regulatory decisions for industrial chemicals, pesticides, pharmaceuticals, cosmetics, food additives and food contact substances in developed countries today.

Methods in Biology Safety Evaluation

This course will provide the knowledge of environmental pollutants and risk assessment of environmental pollutants and the methods of protection.

Carcinogenic and Mutagenic Toxicology

This course will provide the knowledge of chemical carcinogen and mutagen and risk assessment method of carcinogen.

Separation Method of Natural Products

The purpose of this study is to study practical methods to purify or qualitatively or quantitatively analyze the components of natural products using various chromatography methods, thereby enabling research into a secondary stage such as component research or activity research.

Advanced Microbiology 1, 2

This course will provide the new research trends among microorganisms and its application.

Mycology

This course will provide the knowledge of fungi, including their genetic and biochemical properties, their taxonomy and their use to humans, including as a source for tinder, traditional medicine, food, and entheogens, as well as their dangers, such as toxicity or infection.

Infection Diseases

This course will provide the knowledge the Infectious diseases caused by bacteria, viruses, fungi or parasites.

Structural Analysis of Organic Compounds

Nuclear Magnetic Resonance, Infrared Spectroscopy, Ultraviolet Spectroscopy, Mass Spectrometry, etc. are comprehensively applied to cultivate the ability to reveal the structure of organic compounds.

Quality Control for Drug

Improve and develop the analysis technology required for quality control of pharmaceuticals so that they can be applied in the actual pharmaceutical field.

Statistical Data Analysis

Learn the theories of parametric and non-parametric methods of statistical data analysis, and develop the ability to read and interpret theses related to health, medicine, and pharmacy using these theories.

Official Analysis

Compare pharmaceutical compendia of various countries, and familiarize yourself with the test methods included in them. Understand the principles of the test methods listed in the compendium, and further research and develop simple and practical analysis methods.

Advanced Enzymology

It studies the structure, function, and kinetics of enzymes that catalyze all metabolisms in the body, focuses on his application and application to enzymes that are essential factors in pathology and metabolic abnormalities, and DNA amplification reactions and DNA synthesis using RNA reverse transcriptase.

Advanced Alkaloid Chemistry

We study the characteristics and types of alkaloids, their chemical structure and properties, and their medicinal effects.

Methods in Studies of Natural Products Medicine

Based on the new research results based on the physiologically active ingredients contained in natural products, the possibility of development as a new drug and functional food of natural products is explored.

Seminar in Natural Products

We seek to acquire the latest knowledge, focusing on various recent papers related to natural products.

Inflammation

Develop the ability to study the development and mechanism of action of anti-inflammatory drugs by understanding the causes and pathological mechanisms of inflammation, mediators of inflammation, and pathophysiology.

Herbal Medicines 2

The pharmacological theory of oriental medicine is established following a special theory on pharmacology that combines herbal theories and modern herbal medicine theories.

Herbal Prescriptions 1

This course focuses on understanding existing medicines (Sanghanron, etc.) that have been recorded by combining various drugs, organizing the characteristics of each drug, and studying the reasons why it has been used.

Herbal Prescriptions 2

After understanding and researching the composition of existing control agents, we will combine modern biopharmaceutical applications to construct new control agents and establish clinical applications.

Research of Sasang Constitutional Medicine

Focusing on Lee Je-ma's Dongeui-Suse-Bowon, this course will understand basic ideology, study how to distinguish Sasang people, and link with Sasang drugs, and their efficacy.

Advanced Health Functional Foods

Focusing on functional foods listed in the Health Functional Food Act, we study functional foods under development and resources with potential for development.

Tumor Pathophysiology

This class includes causes and pathogenesis of cancer. Students can understand how to develop anti-cancer drugs and their uses by learning Tumor Pathophysiology.

Environmental and Nutritional Diseases

To study the causes and mechanisms of various diseases resulting from environmental pollution or nutritional imbalance, we prepare the basis for the development of functional nutrients.

Vascular Disease Pathophysiology

The causes, pathological mechanisms, symptoms, symptoms, and treatment methods of blood, heart, and vascular system diseases are discussed, and knowledge is acquired to cultivate the ability to research methods for developing treatments for these diseases.

Pathophysiology on Respiratory Diseases

Research on the causes and mechanisms of bronchial and lung diseases to cultivate knowledge for the development of therapeutic agents to treat respiratory diseases.

Neuropathophysiology

Diseases resulting from abnormalities in the autonomic nerve and central nerve transmission tract, the mechanism of action voltage generation, and the transmission of excitation of the muscle nerve, and methods for studying the mechanism of action of drugs acting on them are discussed

Pathophysiology on Endocrine Diseases

By improving the understanding of the pathogenesis and symptoms of endocrine disorders, the ability to develop medicines that control hormone secretion is cultivated.

Gastroenterological Pathophysiology

Acquire knowledge of gastrointestinal, liver, and biliary tract diseases, and improve understanding for the development of digestive disease treatments through research on their pathogenesis.

Neurophysiology 2

This is an intensive course for neuronal structure, functions and its modulations. It can help students improve their research performance on neuroscience.

Neuropharmacology 2

This course is based on knowledge of neuropharmacology and experiments. Students can study about drugs acting on nervous system through physicochemical properties, pharmacokinetic properties and mechanism of action. It can help students improve neuroscience research skills.

Pharmacotherapeutics

Based on basic knowledge on pharmacology, students can improve effective treatment of disease using drugs and research tools by studying clinical application of drugs, strategy of pharmacotherapeutics, side effects, drug interaction and other factors which involve therapeutic effects.

Toxicology 1

Students can have the knowledge on the origin, physicochemical properties, absorption, distribution, metabolism, excretion of toxic materials and its effects on the body. Students can also learn about toxic mechanisms, prevention and detoxication and its clinical application. It can help students to improve their research ability on toxicology.

Toxicology 2

Students can have the knowledge on the origin, physicochemical properties,

absorption, distribution, metabolism, excretion of toxic materials and its effects on the body. Students can also learn about toxic mechanisms, prevention and detoxication and its clinical application. It can help students to improve their research ability on toxicology.

Molecular Pharmacology

Students can improve research competency on physiology, pathophysiology and therapeutic techniques by discussing molecular pharmacological changes and mechanisms of drug actions.

Advanced Endocrinology

This course is based on basic understanding of human anatomy, physiology and pathology. It will provide physiology and pathology of endocrine system, biochemical responses and mechanisms of hormones. By learning all of these, students can understand the application of drug action on endocrine system and research on these.

Pharmacokinetics

It is based on the basic understanding of physicochemical properties of drugs. Students will learn and research factors which are involved in absorption, distribution, metabolism and excretion. After this course, students can make an effective dosage design and research performance.

Advanced Pathobiochemistry

Lectures on the definition of laboratory equipment and standards necessary for measuring enzymes and electrolytes, essential for diagnosing diseases, and their relationship with conditions.

Clinical Immunology

Lectures are given on the mode of action of defense mechanisms in vivo, changes in immune mechanisms due to diseases, immunogenetics, diseases caused by abnormal immune mechanisms, and immunotherapeutic agents.

Advanced Cell Biology

This course will provide the structure, function and behavior of cells. Advance cell biology encompasses both prokaryotic and eukaryotic cells and has many subtopics which may include the study of cell metabolism, cell communication, cell cycle, biochemistry, and cell composition.

Advanced Biotechnology

This course will provide the knowledge of experimental techniques that used in DNA recombination, protein expression and cell culture.

Plants Biotechnology

Research on the production method of medicinal ingredients using biotechnology such as genetic manipulation for useful medicinal plants.

Chemotaxonomy of Medicinal Plants

Research on the relationship between the ingredients of medicinal plants and the taxonomic position of the plant.

Analysis of New Drug

Develop the ability to systematically synthesize various analysis methods for the analysis of new medicines or unknown samples.

Automatic Analysis

We search for ways to automate various existing analysis methods and study principles that can establish simple and accurate analysis methods.

Analysis of Biological Samples

Learn how to handle samples, how to pre-process samples, how to remove interfering substances, and biochemical and immunological detection methods necessary for analyzing and evaluating biological metabolites.

Theory on Drug Receptor

Students can study and explore the distribution of drug binding proteins, binding types, factors involved in binding and the molecular biological changes and mechanisms that occur after drug binding at cellular levels. Students can also cultivate their ability to conduct research on physiology, pathology and therapeutic technology.

Methods for Neuroscience Research

This class may need basic knowledge about neurophysiology including structure and functions of neuron. Students will learn about experimental methods for research in neurophysiology, neurotoxicology and neuropharmacology. They can improve their research execution ability on neuroscience through this class.

Immunobiology

Immunity is a function that suppresses the occurrence of diseases, and it plays an essential role in preventing diseases caused by microorganisms infected from the outside. This class will study how the body's immune system is structured and how these components interact to protect the host from external infections. In particular, the cells and molecules that make up the immune system will be studied in detail. By studying their interactions, cell biology, and molecular biology, an understanding of immune phenomena will be obtained.

Chemistry of Cytokines

The immune system functions by cooperating with cells such as T cells and macrophages. At that time, cells cooperate by exchanging various information. Cytokines are substances that transmit information between cells and refer to

low molecular weight proteins that control cell functions. It regulates multiple cellular responses, such as cell proliferation, differentiation, and cell death. One cytokine has different actions (pluripotency), or various cytokines have the same action (redundancy). Based on these facts, lectures are given in relation to diseases and immunotherapeutic agents.

Biopharmaceuticals 1

Synthetic drugs were dominated by pharmaceuticals so far, but now in 2020, biopharmaceuticals expand their territory. The biopharmaceutical market has a 28% share in the global market in 2018 and is expected to reach 32% in 2024.

Biopharmaceuticals 2

Through the human genome project, access to information on genomes has been improved, and recent advances in biotechnology, molecular biology, and biochemistry have led to research, development, and release of biopharmaceuticals. These biopharmaceuticals are being developed in new forms, different from chemical drugs. In this lecture, we will understand the mechanisms of biopharmaceuticals developed so far, study their development process, and then teach them to research and develop actual biopharmaceuticals. Biopharmaceutical 2 lectures on recombinant drugs, developing new biopharmaceuticals that can treat specific diseases, and preparing proposals for research directions.

Industrial Microbiology

It includes research on the development of industrial microorganisms using genetic engineering techniques and the production of industrial useful materials.

Diagnostic Microbiology

This course will provide the knowledge of new methods to rapidly detect and accurately identify implicated microorganisms in test specimens through a variety of technique.

Topics in Crude Drug Preparation

After understanding and studying the composition of existing control agents, apply modern biopharmaceutical applications to construct new control agents and utilize them for disease treatment.

Research of Traditional Medicine

Study the consideration and utilization of traditional drug treatment and apply it to the modern day to achieve the maximum treatment effect.

Methods for Toxicology Research

This is an advanced course for toxicology. This course will help students to improve research performance in toxicology by learning and studying

experimental methods which can be applied to investigate the migration process of toxic substances and toxic mechanisms in the body.

Pharmaceutical Statistics

Acquire knowledge to rationally evaluate the analysis results of various types of medicines using statistical methods.

Instrumentation in Pharmaceutical Analysis

Based on the knowledge of the theory of operation of analysis devices, students can freely use analysis devices by understanding the actual configuration and applied principles.

Advanced Pharmacotherapy I, II

Students learn the principles to make safe, appropriate and economical choices by examining the appropriateness of drug selection, the principle of treatment strategy, the appropriateness of dose and usage, review of interactions, confirmation of effects, and adverse reactions.

Topics of Drug information

Students learn about the operation and efficient use of drug information management and information provision.

Clinical Pathophysiology

Students understand pathophysiology, which is the basic theory of disease development and pharmacotherapy.

Clinical Pharmacy Practice I, II

As a pharmacist, work in the clinical practice site, identify problems and points of improvement based on the cases obtained during them, discuss them, and apply them to improvement.

Studies in Drug interaction

Students learn about various drug interactions that occur in clinical settings.

Studies in Clinical Pharmacy

Students investigate, discuss, and learn about the latest clinical pharmacology theories and cases.

Medication Safety Management

Students learn the theory of drug safety use management in individual patients, population, pharmacies, and medical institutions.

Biostatistics

Students learn about the application of biostatistics to clinical pharmacy.

Clinical immunology

Learn about the mode of action of defense mechanisms in vivo, changes in immune mechanisms due to diseases, immunogenetics, classification by abnormalities in immune mechanisms, and immunotherapy.

Community Pharmacy Pharmacotherapy

Students learn the theory of improvement of patient pharmacotherapy therapy unique to community pharmacies and selection of over-the-counter drugs.

Pharmacy practice education

This class review various educational systems for pharmacists and pharmacist students, and study sustainable pharmacist education models.

Topics of Managed care pharmacy

Students learn about the theory and practice of managed care pharmacy.

Theory & Practice of Counselling for Patients

In this class, students learn patient counseling theory professionally to provide effective medication teaching service and counseling to patients with diseases and their caregivers.

Pharmaceutical Research Methodology

Students learn how to select research design methods that are suitable for pharmaceutical research topics and purposes and the purpose of research.

Evidence Based Pharmacotherapy

Through lectures and discussions, students learn how to apply evidence-based principles in the decision-making process of clinical pharmacy.

pharmacotherapy for Infection Diseases

In this course, students will study and discuss on the evidence-based pharmacotherapy for the various infection diseases.

Pharmacotherapy for Cardiovascular Disease

In this course, students will study and discuss on the evidence-based pharmacotherapy for the treatment of various cardiovascular diseases

Pharmacotherapy for GI and Nutritional Disorder

This is a process of researching and discussing evidence-based pharmacotherapeutic approaches and rational supply of intravenous and enteral nutrition for the treatment of various digestive disorders, malnutrition, and diseases caused by nutritional imbalance, such as obesity.

Pharmacotherapy for Renal Urologic Disorders

This course is to study and discuss about effective therapeutic methods of kidney and urinary diseases such as acute and chronic renal failure and enlargement of the prostate.

Pharmacotherapy for Neurologic and Psychiatric Disorders

In this course, students will study and discuss on efficient therapeutic options for depression, schizophrenia, bipolar disorder, anxiety, ADHD.

Pharmacotherapy for Endocrinology Diseases

It is a process of researching and discussing how to effectively treat diabetes,

thyroid hormone abnormalities, and adrenocortical hormone abnormalities.

Pharmacotherapy for Gynecologic and Obstetric Disorder

This course consists of research and discussion on contraception, women's menopausal disorders, drug treatment during pregnancy, and drug treatment for lactating mothers.

Pharmacotherapy for Transplant Patients and Immunologic Disorder

This is a process of researching and discussing autoimmune diseases such as lupus and rheumatoid arthritis and other diseases related to immunity as well as pharmacology to minimize problems that occur after organ transplantation.

Pharmacotherapy for Hematology/Oncology Disorder

This is a process of researching and discussing treatment methods for various blood cancers and tumors based on various clinical studies.

Pharmacotherapy for Respiratory Disorders

It is a process of researching and discussing treatment methods for Asthma, COPD, pulmonary artery hypertension, pulmonary fibrosis, and respiratory failure.

Pediatric Pharmacotherapy

It is a process of researching and discussing how to treat various diseases that children may have.

Pharmacotherapy for Ophthalmic Disorder

This is a process of researching and discussing treatment methods for various eye diseases such as glaucoma and eye infection.

Pharmacotherapy for Dermatologic Disorder

It is a process of researching and discussing ways to treat and prevent various skin diseases such as skin infections and skin allergies.

Pharmacotherapy with Non-prescription Medication I, II

It is a process of researching and discussing the appropriate use of over-the-counter drugs.

Methodology for Clinical Research I, II

This course is designed to design research methods necessary for clinical research, collect academic information, collect clinical data, analyze them with statistical methods, etc., and learn how to logically describe them through theory and practice.

Advanced Clinical Practice I, II

It is a course in which students learn how to apply all theoretically learned pharmacological knowledge while caring for actual patients while caring for patients at domestic and international hospitals.

Methodology for Clinical Practice Education

This is a process of researching and discussing pedagogical knowledge, educational methods, and clinical education and evaluation methods necessary for educators who guide pharmacy students' clinical practices in hospitals and pharmacies.

Development of Tool for prediction of Pharmacotherapy Outcomes

In this course, students will learn how to develop statistical tools for predicting desired pharmacotherapeutic outcome and adverse effects, and verify usefulness of these tools.

Pharmacotherapy for the Skeletal and Muscle Disorders

This course is a process of researching and discussing the pharmacological approaches necessary during the treatment of degenerative arthritis, myositis, or musculoskeletal injuries.

Analysis and evaluation of Clinical Literatures

In this course, students will learn how to analyse articles from clinical and statistical aspects so that they may make a decision which clinical outcome will be applied to the real clinical practice.

Pharmacoeconomics

In order for a new drug or new medical technology to be given an appropriate price and listed on the health insurance care benefit list, a valuation of cost effectiveness must be made. This subject is a process of evaluating the economic feasibility of clinical performance compared to the required cost of drugs, and learns the economic evaluation theory and analysis methodology.

Advanced Pharmacoeconomics

Acquire the theory and practical methodologies necessary to build an economic evaluation model using Decision tree model and Markov model, and cultivate the ability to perform actual economic evaluation using programs

Topics in Social Pharmacy Research

It learns social science methodologies that can be used to explain social phenomena related to patients, and cultivates practical applicability through the design and analysis of surveys to solve research problems.

Pharmacoepidemiology

From the drug development stage to the marketing authorization process and the post-marketing follow-up stage, the safety of the drug is continuously evaluated to learn the epidemiological knowledge and research methodology necessary to perform risk management.

Systematic Review & Meta-Analysis

We learn systematic literature review, which is a research method that synthesizes the best available research results for specific research questions,

and meta-analysis, a research method that synthesizes statistically when the basis in the primary study is quantitatively synthesized. Through this subject, the ability to systematically identify, evaluate, and synthesize high-quality evidence for research questions in the actual clinical field is cultivated.

Pharmaceutical Pricing and Reimbursement Policy

Learn about the theory of drug price policy, the process of registering health insurance care benefits in Korea, and insurance drug price management policies.

Healthcare Economics

As people's desire for a healthy life increases, the amount of economic resources injected into the health care sector increases, and the economic feasibility of resources is emerging. In this subject, we learn the theory and analysis model of economics to deal with various problems related to the production, distribution, and consumption of health care.

Health Insurance Policy

Understand the concept and composition of the health care system and health security system, and discuss major issues such as guarantee and fee determination. It is compared with the health care system and health security system of the excluded countries.

Pharmacist & Pharmacy in Healthcare System

Understand the concept and composition of the health care system and health security system, and discuss major issues such as guarantee and fee determination. It is compared with the health care system and health security system of other countries.

Fundamentals of Biostatistics

Acquire knowledge and methodology of technology and inference statistics for analyzing data in the field of medicine, and cultivate basic analysis capabilities.

Data Manipulation and Analysis in Healthcare Big Data

Learn how to properly process and analyze major databases widely used in health care, such as national health insurance data and national health and nutrition survey data, according to the research purpose.

Seminar in Social Pharmacy

Summarize and discuss the latest policy studies in the field of social pharmacology, economic evaluation studies, and papers or reports of drug epidemiological studies.

Science Research Writing & Research Ethics

Learn how to write a thesis for academic journal submission, how to post, how to select and conduct research on thesis topics, and how to write a

dissertation. In addition, it learns desirable norms that should be basically followed for responsible research performance.

Pharmaceutical Affairs Law

Learn pharmacist-related laws and regulations that are the basis of systems related to medicines and pharmaceuticals. Learn the significance and interpretation of the Pharmaceutical Affairs Act and the background and meaning of the administration of pharmacists to learn under what regulations drugs are developed, produced, distributed, and used.