

Master of Pharmacy Program in Clinical Pharmacy

(Curriculum revised in 2022)

Curriculum Structure

Course	Program A	
	Plan A1	Plan A2
1. Core Subjects	-	3 Credits
2. Prerequisite Course	-	20 Credits
3. Elective Courses not less than	-	4 Credits
4. Thesis	36 Credits	12 Credits
Total not less than	36 Credits	39 Credits

1. Core subjects

Code	Course	Credits
0703 721	Research Methodology and Statistical Methods in Clinical Pharmacy	3(3-0-6)

2. Prerequisite Course counted Credits

Code	Course	Credits
0703 705	Advanced Pharmacotherapy 1	3(3-0-6)
0703 706	Advanced Pharmacotherapy 2	3(3-0-6)
0703 714	Applied Pharmacokinetics and Pharmacodynamics in Clinical Practices	2(2-0-4)
0703 723	Applications of Health Sciences Research to Clinical Pharmacy Practice	2(1-2-3)
0703 724	Evidence-Based Medicine	2(2-0-4)
0703 725	Writing for Clinical Pharmacy Research	1(0-2-1)
0703 816	Seminar in Clinical Pharmacy 1	1(0-2-1)
0703 817	Clinical Pharmacy Clerkship	5(0-15-0)
0703 820	Seminar in Clinical Pharmacy 2	1(0-2-1)

3. Elective Courses

Code	Course	Credits
0703 707	Enteral and Parenteral Nutrition	2(1-2-3)
0703 708	Pharmaceutical Care in Patients with Cardiovascular Diseases	2(1-2-3)
0703 709	Pharmaceutical Care in Patients with Kidney Diseases	2(1-2-3)
0703 710	Pharmaceutical Care in Patients with Infectious Diseases	2(1-2-3)
0703 711	Pharmaceutical Care in Patients with Oncologic Diseases	2(1-2-3)
0703 712	Pharmaceutical Care in Patients with Critically Ill	2(1-2-3)
0703 713	Pharmaceutical Care in Pediatrics	2(2-0-4)
0703 719	Pharmaceutical Care in Patients with Psychiatric Disorders	2(2-0-4)
0703 720	Pharmaceutical Care in Patients with Central Nervous System Disorders	2(2-0-4)
0703 726	Data Management for Clinical Pharmacy Practice	2(1-2-3)
0703 727	Pharmacogenomics	2(2-0-4)
0703 728	Management and Surveillance of Biological Products	2(2-0-4)
0703 821	Advanced Statistical Methods in Clinical Pharmacy	2(2-0-4)
0703 822	Elective Clerkship	4(0-12-0)
0703 823	Exchanging Program in Clinical Pharmacy Practice in Foreign Countries	2(1-2-3)
0703 824	Digital Health	2(2-0-4)
0701 725	Pharmacoepidemiology	2(2-0-4)
0701 726	Pharmacoeconomics	2(2-0-4)

4. Thesis

Code	Course	Credits
0703 819	Thesis (Plan A1)	36 Credits
0703 818	Thesis (Plan A2)	12 Credits

Example for Study Plan

Program Plan A1

	Course	Credits
Year 1, Semester 1		
0703 721	Research Methodology and Statistical Methods in Clinical Pharmacy	0*
0703 819	Thesis	3
	Total	3
Year 1, Semester 2		
0703 819	Thesis	9
	Total	9
Year 2, Semester 1		
0703 819	Thesis	12
0703 816	Seminar in Clinical Pharmacy 1	0*
	Total	9
Year 2, Semester 2		
0703 819	Thesis	12
0703 820	Seminar in Clinical Pharmacy 2	0*
	Total	6

* Courses that are registered without credit but require a passing evaluation with an 'S' grade

Program Plan A2

Course	Credits
Year 1, Semester 1	
0703 705 Advanced Pharmacotherapy 1	3(3-0-6)
0703 721 Research Methodology and Statistical Methods in Clinical Pharmacy	3(3-0-6)
0703 724 Evidence-Based Medicine	2(2-0-4)
070x xxx Elective	2(2-0-4)
Total	10
Year 1, Semester 2	
0703 723 Applications of Health Sciences Research Methodologies to Clinical Pharmacy Practice	2(1-2-3)
0703 714 Applied Pharmacokinetics and Pharmacodynamics in Clinical Practices	2(2-0-4)
0703 706 Advanced Pharmacotherapy 2	3(3-0-6)
0703 816 Seminar in Clinical Pharmacy 1	1(0-2-1)
070x xxx Elective	2(2-0-4)
Total	10
Year 2, Semester 1	
0703 820 Seminar in Clinical Pharmacy 2	1(0-2-1)
0703 725 Writing for Clinical Pharmacy Research	1(0-2-1)
0703 817 Clinical Pharmacy Clerkship	5(0-15-0)
0703 818 Thesis	3
Total	10
Year 2, Semester 2	
0703 818 Thesis	9
Total	9

Course Description

0703 721 Research Methodology and Statistical Methods in Clinical Pharmacy 3(3-0-6)

Philosophy and concept of research, type of research, research process, scientific reasoning, literature review, research question, research hypothesis, research objective, research conceptual framework and variables, research design, population and sample, sample size determination, sampling methods, development and quality testing of research instruments, data collection, research ethics, data analysis, basic statistics, report writing and reference management

0703 705 Advanced Pharmacotherapy 1 3(3-0-6)

Pharmaceutical care concepts, systematic approach of drug-related problems and pharmaceutical care plan, communication skill and patient counseling, rational drug use, the application of digital health, case studies of pharmaceutical care in infectious diseases, respiratory system, gastrointestinal tract system, cardiovascular system, kidney and urinary system, as well as pharmacotherapy in pediatrics, geriatrics, and pregnant and lactating women

0703 706 Advanced Pharmacotherapy 2 3(3-0-6)

Critical thinking and systematic approach to solving drug-related problems, pharmaceutical care plan, rational drug use, standard treatment guidelines and recent evidence-based medicine for pharmaceutical care practice in endocrine system, rheumatology, dermatology, neurology, psychiatry, hematology, and oncology

0703 714 Applied Pharmacokinetics and Pharmacodynamics in Clinical Practices 2(2-0-4)

Principles of pharmacokinetics, pharmacodynamics, pharmacogenomics and personalized medicine concepts, therapeutic drug monitoring principle and clinical application, pharmacokinetics in special population (elderly, children, pregnancy, obesity and critical ill patients), pharmacokinetics in dialysis, clinical relevant pharmacokinetic drug interactions, population pharmacokinetics, bioequivalence and biosimilar, pharmacokinetics and pharmacodynamics of antibiotics, case discussion for therapeutic drug monitoring of antibiotics, antiepileptic drugs and immunosuppressants, literature evaluation of related articles and clinical application

0703 723 Applications of Health Sciences Research to Clinical Pharmacy Practice 2(1-2-3)

Reviews and application of core concepts in quantitative and qualitative research related to clinical pharmacy practice and in compliance with relevant health policy, practice of conducting literature reviews, designing proper research methods and planning for processing research to address research questions from clinical pharmacy practice (routine to research), writing research proposal for ethical approval, collecting research data, analyzing research information and using proper statistical analysis and writing a research report and practice of disseminating of research report by delivering both oral and poster presentations

0703 724 Evidence-Based Medicine 2(2-0-4)

Application of evidence-based medicine for research and clinical practice, knowledge, skill, using health technology, information search methods, and appraisals of health research articles

0703 725 Writing for Clinical Pharmacy Research 1(0-2-1)

Principles of academic writing, components of research report, managing report format by Microsoft Word, writing introduction, literature review, quantitative research methods, qualitative research methods, and research results; selection of appropriate journal for research topic, managing references, writing exercise for clinical pharmacy research

0703 816 Seminar in Clinical Pharmacy 1 1(0-2-1)

To practice essential skills of literature evaluation, analytical and synthesis, literature review, discussion, report writing for literature reviews, and oral presentation for the research topic related to master thesis or any topics related to an innovation of clinical pharmacy research or current health care practice and policy

0703 817 Clinical Pharmacy Clerkship 5(0-15-0)

Prerequisite:

0703 705 Advanced Pharmacotherapy 1

0703 706 Advanced Pharmacotherapy 2

Advanced pharmaceutical care practice experiences in specific area of internal medicine or ambulatory care in hospital e.g., cardiovascular diseases, kidney diseases, oncologic diseases, infectious diseases, multidisciplinary ward rounds, medical chart review,

patient documentation, patient assessment, pharmaceutical diagnosis, medication therapy management, communication skills with health care providers, counseling practice to patient and caregivers, case discussion, formal case presentations, case report writing, journal club and drug information services

0703 820 Seminar in Clinical Pharmacy 2 1(0-2-1)

To practice essential skills of literature evaluation, analytical and critical thinking, discussion, including English skill for report writing and oral presentation of the research topic related to master thesis or any topics related to an innovation of clinical pharmacy research or current health care practice and policy and to practice the delivery of academic oral presentation and discussion and academic writing

0703 707 Enteral and Parenteral Nutrition 2(1-2-3)

Nutritional status assessment, nutritional route selection, nutritional formulation and calculation for individual patients, preparing parenteral nutrition, clinical outcome monitoring, preventing, and solving problems in patients receiving nutrition, counseling and educating enteral and parenteral nutrition and products

0703 708 Pharmaceutical Care in Patients with Cardiovascular Diseases 2(1-2-3)

Principles of pharmacotherapy of cardiovascular diseases, recent research in pharmacotherapy and guideline treatment of cardiovascular diseases, principles of patient assessment; physical assessment, chart review, medication history and patient counseling; the process of choosing an appropriate drug therapy for individual patient characteristics, benefits, and risks, role of pharmacist as a drug advisor, practice and case studies in hospitals

0703 709 Pharmaceutical Care in Patients with Kidney Diseases 2(1-2-3)

Pathophysiology review of common kidney diseases and its complications, pharmacotherapy with standard treatment guidelines and evidence-based medicine in common kidney diseases and its complications, and drug dosing, prevention and management of drug-induced nephrotoxicity, particularly, pharmaceutical care in chronic kidney disease and renal replacement therapy including hemodialysis, peritoneal dialysis, and kidney transplantation, counseling for patients and caregivers, and nutritional education for kidney disease patients

0703 710 Pharmaceutical Care in Patients with Infectious Diseases 2(1-2-3)

Pathophysiology review of infectious diseases, e.g., bacterial and viral origin in humans, application of pharmacologic knowledge, principle of pharmacotherapy, antimicrobial drugs selection in drug-resistant infectious diseases, therapeutic goals, optimal therapeutic plans, dosage adjustment, outcome monitoring, and patient counseling for patients with infectious diseases through case studies

0703 711 Pharmaceutical Care in Patients with Oncologic Diseases 2(1-2-3)

Pathophysiology review of cancer and complications, cancer chemotherapy with standard treatment guidelines and recent evidence-based medicine in common cancers, principle of chemotherapy, efficacy and toxicity of cancer chemotherapy monitoring, cancer pain management, outcome of cancer treatment, principle of preparation and administration of cancer chemotherapy

0703 712 Pharmaceutical Care in Patients with Critically Ill 2(1-2-3)

Pharmaceutical care and management in critically ill patients including acute renal failure, acute respiratory distress syndrome, liver failure, severe sepsis/septic shock, acid-base disorders, thromboembolic disorders, head trauma, cardiac arrhythmia, multi-organ dysfunction syndrome, pharmacokinetic assessment, adverse drug reaction evaluation, recognition of drug-drug interactions, monitoring and life supporting tools, and new therapeutic technology

0703 713 Pharmaceutical Care in Pediatrics 2(2-0-4)

Developmental stage of growth, common pediatric disease, reading and interpretation of physical examination and laboratory value in pediatric patients, pharmacokinetics and pharmacodynamics in pediatrics, the knowledge and skills to provide pharmaceutical care to pediatric patients in both ambulatory and inpatient settings

0703 719 Pharmaceutical Care in Patients with Psychiatric Disorders 2(2-0-4)

Pharmacology of psychiatric drugs and pathophysiology of common psychiatric disorders, pharmacotherapy with standard treatment guidelines of psychiatric disorders, evidence-based medicine, and recent research in pharmacotherapy of psychiatric disorders, principles of psychiatric disorders patient assessments, pharmaceutical care in patients with psychiatric disorders, and case studies in hospitals

0703 720	Pharmaceutical Care in Patients with Central Nervous System Disorders	2(2-0-4)
Principles of pharmacotherapy of central nervous system disorders, recent research in pharmacotherapy and guideline treatment of central nervous system disorders, principles of patient assessment, physical assessment, chart review, medication history taking, and patient counseling, the process of choosing an appropriate drug therapy based on individual patient characteristics, benefits, and risks, role of pharmacist as a drug advisor, practice and case studies in hospitals		
0703 726	Data Management for Clinical Pharmacy Practice	2(1-2-3)
Data preparation for effective analytical procedures, fundamental processes of data management in clinical pharmacy practice such as data collection, data cleansing and data integration; Data and information presentation method		
0703 727	Pharmacogenomics	2(2-0-4)
Basic human genetics and pharmacogenomics, pharmacogenomics of drugs used in cardiovascular diseases, cancer, psychiatry disorders, epilepsy, AIDS, immune system disorders, skin drug allergy, current research literature, personalized medicine		
0703 728	Management and Surveillance of Biological Products	2(2-0-4)
Biological products and biosimilar, principles for considering similarity of biosimilar products, preclinical requirements for product approval and development, clinical study design of biosimilars, registration of biological products, selection of biological and biosimilar products, common biological product use and clinical evidence, topics to concern of biological product dispensing, start and transition of product, safety and monitoring system		
0703 821	Advanced Statistical Methods in Clinical Pharmacy	2(2-0-4)
Advanced statistical methods for complex clinical pharmacy research including model testing, decision theory, application of advanced statistical methods, essential advanced statistics for research, practical research examples and exercise, selection appropriated statistics for research		

0703 822 Elective Clerkship 4(0-12-0)

Pharmaceutical care practice experiences in specific areas of internal medicine or ambulatory care in hospitals e.g., cardiovascular diseases, kidney diseases, oncologic diseases, infectious diseases, adverse drug reaction monitoring, warfarin clinic, diabetic clinic, and HIV clinic etc; attend ward round, medical chart review, patient documentation and assessment, pharmaceutical diagnosis and medication therapy management, communication skills with health care providers, counseling practice to patients and caregivers, case conferences, formal case presentations, case report writing, critical appraisal for primary research articles, and drug information services

0703 823 Exchanging Program in Clinical Pharmacy Practice in Foreign Countries 2(1-2-3)

Exchanging experience in clinical pharmacy with foreign countries under cooperation with the Faculty of Pharmacy, Mahasarakham university in the area of pharmacist role in providing patient care in hospitals, community pharmacies, and other community organizations, medical technology, interprofessional work, interprofessional education, research in clinical pharmacy or in other areas that impact patient care, and health system for each country

0703 824 Digital Health 2(2-0-4)

Digital health care programs, technologies with health, healthcare, living, and society, for example, telemedicine, and telepharmacy, to enhance the efficiency of healthcare delivery and to make medicine more personalized and precise, using information and communication technologies, and core competence for health promotion to facilitate understanding of people health problems resulting in people receiving appropriate medical treatment and social prescribing in more personalized and precise ways

0701 725 Pharmacoepidemiology 2(2-0-4)

Principle of epidemiology, causal relationship, epidemiological measurement, measurement error, pharmacoepidemiological study designs and calculations such as descriptive study, cross-sectional study, case-control study, cohort study, experimental study, systematic review and meta-analysis, surveillance and investigation

0701 726 Pharmacoeconomics 2(2-0-4)

Principle of economics, demand and supply, cost, economic outcomes, equity of health utilization, basics of pharmacoeconomics and applications, cost analysis and break even point analysis, cost-minimization analysis, cost-effectiveness analysis, cost-benefit analysis, cost-utility analysis, health technology assessment, and outcome research

0703 818 Thesis (Plan A2) 12 Credits

Research project focusing on clinical pharmacy areas, system development in routine practice, practicing being a researcher, searching and reviewing literature, proposal writing, research planning, collecting research data, analyzing research data by using proper statistical methods, writing up master thesis

0703 819 Thesis (Plan A1) 36 Credits

Research project in the area of clinical pharmacy, pharmaceutical care, pharmacy practice, system development in routine practice, and systematic review and meta-analysis, practicing in information retrieval skill, article reviewing, proposal writing, planning, data analyzing by applying basic statistics, practices research presentations including research article preparation