

Master of Science Program in Medicinal Plants and Thai Traditional Medicines (Curriculum revised in 2021)

Curriculum Structure

Course	Program A Plan A2
1. Core Subjects	3 Credits
2. Prerequisite Course	8 Credits
3. Elective Courses not less than	15 Credits
4. Thesis	12 Credits
Total not less than	38 Credits

1. Core subjects

Code	Course	Credits
0701 705	Research Methodology for Pharmaceutical Research	3(3-0-6)

2. Prerequisite Course counted Credits

Code	Course	Credits
0702 701	Seminar in Medicinal Plants and Thai Traditional Medicine 1	1(1-0-2)
0702 702	Seminar in Medicinal Plants and Thai Traditional Medicine 2	1(1-0-2)
0702 728	Pharmacology of Medicinal Plants and Natural Products	3(3-0-6)
0702 729	Laboratory Techniques and Pharmaceutical Organic Chemistry	3(2-3-4)

3. Elective Courses

Code	Course	Credits
0702 715	Applied Thai Traditional Pharmacy	3(2-3-4)
0702 716	Chinese Traditional Pharmacy	3(2-0-6)
0702 723	Applied Ethnobotany	3(2-0-6)
0702 801	Knowledge Capturing from Thai Traditional Medicine Scripture	3(3-0-6)
0703 802	Evidence-based Medicine for Herbal Medicine	3(3-0-6)
0703 803	Clinical Study for Herbal Products	3(3-0-6)

3. Elective Courses

Code	Course	Credits
0702 704	Phytochemistry	3(2-3-4)
0702 706	Separation Techniques from Natural Products	3(2-3-4)
0702 708	Chemical Structure Elucidation of Organic Compounds	3(3-0-6)
0702 717	Cosmetics from Natural Products	3(2-3-4)
0702 718	Business Management of Natural Products	3(3-0-6)
0702 720	Production and Quality Control of Medicines from Herbal and Natural Products 1	3(2-3-4)
0702 721	Production and Quality Control of Medicines from Herbal and Natural Products 2	3(2-3-4)
0702 722	Pharmaceutical Organic Chemistry	3(2-3-4)
0702 725	Applied Biotechnology in Herbals	
0702 727	Quality Assurance of Medicinal Plants and Natural Products	3(2-3-4)
0702 806	Standard of Factories for Herbal Drugs, Nutraceutical and Herbal Cosmetics	3(3-0-6)
0703 807	Biological Activity Assay	3(2-3-4)

4. Thesis

Code	Course	Credits
0702 789	Thesis	12 Credits

Example for Study Plan

	Course	Credits
Year 1, Semester 1		
0701 705	Research Methodology for Pharmaceutical Research	3(3-0-6)
0702 701	Seminar in Medicinal Plants and Thai Traditional Medicine 1	1(1-0-2)
0702 728	Laboratory Techniques and Pharmaceutical Organic Chemistry	3(2-3-4)
	Total	7
Year 1, Semester 2		
0702 702	Seminar in Medicinal Plants and Thai Traditional Medicine 2	1(1-0-2)
0702 729	Pharmacology of Medicinal Plants and Natural Products	3(3-0-6)
070x xxx	Elective	3
	Total	7
Year 1, Semester 3		
070x xxx	Elective	3
070x xxx	Elective	3
	Total	6
Year 2, Semester 1		
070x xxx	Elective	3
070x xxx	Elective	3
0703 818	Thesis	3
	Total	10
Year 2, Semester 2		
0703 818	Thesis	9
	Total	9

Course Description

0701 705 Research Methodology for Pharmaceutical Research 3(3-0-6)

Philosophy and concept of research, type of research and research designs, research process, literature review and information management, research problem, research question and research hypothesis, research objective, conceptual framework, research variables, population and sample, sample size determination, sampling method, development and quality testing of research instruments, data collection, basic statistics, data analysis, research ethics, report and proposal writing

0702 701 Seminar in Medicinal Plants and Thai Traditional Medicine 1 1(1-0-2)

Independent seminar in Thai under the direction of a thesis advisor/program member; seminar topics focusing on herbals and natural products; evaluation and discussion on scientific literatures; the use of sources of current literatures; techniques of searching scientific literatures; presenting and preparation of reports using reference materia

0702 702 Seminar in Medicinal Plants and Thai Traditional Medicine 2 1(1-0-2)

Independent seminar in English under the direction of a thesis advisor/program member, seminar topics focusing on herbals and Thai traditional medicine, evaluation and discussion on scientific literatures, the use of sources of current literatures, techniques of searching scientific literatures, presenting and preparation of reports using reference materials based on improvement of contents and presentation performance in seminar in herbals and Thai traditional medicines 1

0702 728 Pharmacology of Medicinal Plants and Natural Products 3(3-0-6)

The principles of pharmacology; basic principle of pharmacokinetics; pharmacology of medicinal plants and natural products on systemic functions of the body: mechanisms of action; pharmacological activities; adverse reactions and herb-drug interactions

0702 729 Laboratory Techniques and Pharmaceutical Organic Chemistry 3(2-3-4)

Laboratory techniques, laboratory waste disposal, solvent properties, solution preparation, extraction and concentration, chromatographic techniques, precipitation, melting point, boiling point, distillation, scientific calculation and report

0702 715 Applied Thai Traditional Pharmacy 3(2-3-4)

Introduction of Thai traditional medicines, sources of raw materials, uses and tastes of herbal medicines, relationship between tastes and pharmacological activities, mechanisms of substances in herbal medicines, relationship between traditional uses and pharmacological activities, formulation of Thai traditional preparations, analysis of Thai traditional preparations and methods for formulating traditional drugs

0702 716 Chinese Traditional Pharmacy 3(2-0-6)

Historical background of the concept of the disorder, etiology and pathology of disorders, Chinese traditional herbal materia medica, formulation of Chinese materia medica preparations, the relationship of substances within formulas, classification of the formulas, forms of formulas, principles of treatment using herbals and commonly used Chinese prescription in Thailand

0702 723 Applied Ethnobotany 3(2-0-6)

Principles of ethnobotany, influences of plants on human culture, harvesting and conservation of plants, utilization of plants by native people for food and medicines, local wisdom in health and ethnobotany research

0702 801 Knowledge Capturing from Thai Traditional Medicine Scripture 3(3-0-6)

Knowledge capturing, analysis, summary of Thai traditional medicine knowledge and analysis of Thai traditional preparations from Thai traditional Scriptures of Vedchasuksa, Samuthanwinidchai, Dhartwiworn, Dhartwipang, Pathomjindha, Mahachotarat, Worayokhsarn, Chawadam, Rokhanitan, Dhartbunjob, Mudchapakkhunthika, Takasila, Kasai, Abhaisunta, Mancharawichian, Auuthorokh, Mukharokh, Sitthisarasongkhroah, Paichitmahawong, Tipmala, Witheekutharokh and Sappakhun

0703 802 Evidence-based Medicine for Herbal Medicine 3(3-0-6)

The principles of evidence-based medicine (EBM) for herbal medicine, reading with critical appraisal, systematic review and meta-analysis, EBM of herbal medicine in Thai national essential list of medicine, EBM of common diseases, EBM of non-communicable diseases (NCDs), and EBM of popular herbs

0703 803 Clinical Study for Herbal Products 3(3-0-6)

The principles of clinical study for herbal products, safety data of products, study design, population and sample, sample size calculation, randomization and blinding process, recruitment of participants, data collection and quality control, ethical issues, data analysis, interpreting and reporting study results

0702 704 Phytochemistry 3(2-3-4)

Biosynthesis, the groups of primary and secondary metabolites which are potential in medicinal plants, primary screening, extraction, separation, and analytical methods of the active constituents

0702 706 Separation Techniques from Natural Products 3(2-3-4)

Extraction and separation techniques from herbals, solid-liquid extraction, extraction method for individual chemical groups, extraction with supercritical fluids, ultrasounds, microwaves, electrochemical and membrane extraction. Separation technique by chromatography

0702 708 Chemical Structure Elucidation of Organic Compounds 3(3-0-6)

Spectroscopic technique: ultraviolet-visible, infrared, nuclear magnetic resonance spectrometry. Characterization of functional groups, identification and structure elucidation of organic substances through the use of spectroscopy and stereoisomer identification

0702 717 Cosmetics from Natural Products 3(2-3-4)

Principles of formulation and quality control of various cosmetics types consist of cleansing cosmetic, decorative cosmetic and other cosmetic. Application of herbal in production of cosmetics

0702 718 Business Management of Natural Products 3(3-0-6)

Introduction to business in general and natural product business, management of herbal and natural product industries, marketing of herbal and Thai traditional medicines and spa business in Thailand

0702 720 Production and Quality Control of Medicines from Herbal and Natural Products 1 3(2-3-4)

Pre-formulation study, dosage forms, pharmaceutical excipients. Basic theory in pharmaceutical dosage forms, formulation, manufacturing, and quality control of herbal liquids, and semi-solids dosage form

0702 721 Production and Quality Control of Medicines from Herbal and Natural Products 2 3(2-3-4)

Basic theory relates to herbal solid dosage form, micromeritic, unit operation in pharmacy. Formulation, manufacturing, and quality control of herbal solid dosage form

0702 722 Pharmaceutical Organic Chemistry 3(2-3-4)

Structures, properties, reaction and stereochemistry of pharmaceutical organic compounds e.g. alkane, alkene, alkyne, diene, benzene, aryl and alkyl halide, alcohol, phenol, ether, epoxide, aldehyde, ketone, carboxylic acid and their derivatives

0702 725 Applied Biotechnology in Herbals 3(3-0-6)

General knowledge of biotechnology, technical terms and principles. Plant material selection and quality control using biomolecular techniques, herbals improvement technology, plant tissue culture technique. The application of biotechnology technique for secondary metabolite production

0702 727 Quality Assurance of Herbals and Natural Products 3(2-3-4)

Quality control of herbals and natural products by physical, chemical and microbiological methods, quality assurance for production process, contaminant and stability study of medicines from medicinal plants and natural products, degradation mechanism of active ingredients and expiration date estimation for finished products

0702 806 Standard of Factories for Herbal Drugs, Nutraceuticals and Herbal Cosmetics 2(2-0-4)

Types of traditional medicine production facilities, requesting permission for a place to produce traditional medicines, nutraceuticals and herbal cosmetics plan for the production of traditional medicine, good manufacturing practice and quality assurance of herbal medicine production, traditional drug registration and laws of herbal products

0702 807 Biological Activity Assay 3(2-3-4)

Meaning and fundamental aspects of bioassay, experimental and biological assessments in *in vitro* and *in vivo* models

0702 789 Thesis 12 Credits

Research in medicinal plants and Thai traditional medicine; clinical research and development of products, phytochemistry, studying biological activity, develop and quality control of pharmaceuticals, cosmetics and natural products, in-depth original research questions to resolving, developing or generating new knowledge according to the student interests