



School of Bioinnovation and Bio-based Product Intelligence (SCIN)  
Program in Bioinnovation (International Program, Multidisciplinary Program)  
Course: SCIN 382 Phytochemistry and Herbal Products

Degree  Bachelor  Master  Doctoral  
Faculty of Science

<b>Course Code and Course Title</b>	English: SCIN 382 Phytochemistry and Herbal Products Thai: วทนว ๓๘๒ พฤษเคมีและผลิตภัณฑ์สมุนไพร
<b>Number of Credits</b>	2 (2-0-4)
<b>Curriculum and Course Type</b>	Program of Study Bachelor's Degree Program in Science and Technology (International Program, Multidisciplinary Program) Course Type Specific course
<b>Course Coordinator and Teaching Staff</b>	Dr Sitthivut Charoensutthivarakul (SC) Address: K618 Chalermphrakiat Building School of Bioinnovation and Bio-based Product Intelligence, Faculty of Science, Mahidol University Tel: 0-2201-5956 email: sitthivut.cha@mahidol.edu
<b>Semester/Year of Study</b>	Academic Year 2023 Second Semester (2/2024) / 3 <sup>rd</sup> and 4 <sup>th</sup> Year
<b>Prerequisite</b>	SCBM 281 Biochemistry or equivalent
<b>Co-requisite</b>	None
<b>Day/Time/Study Site Location</b>	Monday 9.30-11.30 Faculty of Science, Mahidol University, Salaya Campus
<b>Date of Latest Revision</b>	02 Jan 2025

### Course Learning Outcomes (CLOs)

After successful completion of this course, students are able to

- CLO1: Identify the roles and importance of phytochemicals and herbal products in human's life
- CLO2: Classify each phytochemical compound based on their biosynthetic origins and properties
- CLO3: Choose appropriate techniques of sample preparation and extraction of herbal products
- CLO4: Determine appropriate analytical techniques to identify the active ingredients and control the quality of the product
- CLO5: Propose an idea to develop and improve the quality of herbal product by using the extent of scientific knowledge and current technology
- CLO6: Deliver well-structured presentation to their peers

### Objectives of Development / Revision

The objectives of this course are to provide students the knowledge, principles and analytical skills concerning phytochemistry and the process involved in herbal product's preparation and quality control together with the current trend in this area as well as promote students' communication skills and professional ethics.

### Course Description

ความหมายและความสำคัญของพฤษเคมีและผลิตภัณฑ์สมุนไพร เส้นทางการสังเคราะห์ ประเภทของสารผลิตภัณฑ์จากสมุนไพร การเตรียมตัวอย่างและการสกัดสมุนไพร เทคนิคการแยกและการวิเคราะห์สารพฤษเคมี การควบคุมคุณภาพและ



กฎระเบียบที่เกี่ยวข้อง แนวโน้มและหัวข้อปัจจุบันทางพฤกษเคมีและผลิตภัณฑ์สมุนไพร การนำเสนอผลงานปากเปล่าในหัวข้อผลิตภัณฑ์สมุนไพร

Definitions and importance of phytochemistry and herbal products; biosynthetic pathway; categories of medicinal natural products; sample preparations and extractions of medicinal herbs; separation and analytical techniques of phytochemicals; the quality control and related regulations; current trends and topics in phytochemistry and herbal products; oral presentations in the topic of herbal products

**Credit Hours / Trimester**

Theory (Hours)	Addition Class (Hours)	Laboratory/Field trip/ Internship (Hours)	Self-study (Hours)
30 Hours/Semester (2 Hours x 15 Weeks)	-	-	60 Hours/Semester (4 Hours x 15 Weeks)

**Number of Hours per Week for Individual Advice**

1 hour per week by appointment at **K618** Faculty of Science, Mahidol University, Phyathai Campus or online via <https://mahidol.webex.com/meet/sittthivut.cha>. Students can contact the instructors by email or via the Google Classroom which will be responded during the office hour.

**Evaluation of the CLOs**

Course Learning Outcomes	Measurement Method			Weight (%)
	Class Participation and In-class Discussion	Written Exam	Individual Oral Presentation	
CLO1 Identify the roles and importance of phytochemicals and herbal products in human's life	2%	5%	5%	12%
CLO2 Classify each phytochemical compound based on their biosynthetic origins and properties	2%	16%	7%	25%
CLO3 Choose appropriate techniques of sample preparation and extraction of herbal products	8%	13%	-	21%
CLO4 Determine appropriate analytical techniques to identify the active ingredients and control the quality of the product	8%	13%	-	21%
CLO5 Propose an idea to develop and improve the quality of herbal product by using the extent of scientific knowledge and current technology	-	8%	6%	14%
CLO6 Deliver well-structured presentation to related audiences	-	-	7%	7%
<b>Total</b>	<b>20%</b>	<b>55%</b>	<b>25%</b>	<b>100%</b>



### Measurement and evaluation

After completion of the evaluation process each student is assigned a criterion-referenced grade (as shown in the table below). Evaluation and achievement will be justifying according to Faculty and University code, conducted by grading system of A, B+, B, C+, C, D and F. To pass this course, student must earn a grade of a least D.

Total Percentage of Evaluation	Below 49.5	49.5-54.5	54.5-59.5	59.5-64.5	64.5-69.5	69.5-74.5	74.5-79.5	79.5-100
Grade	F	D	D+	C	C+	B	B+	A

Stats: (1/2021, No. student = 16); A = 43.75%, B+ = 18.75%, B = 12.5%, C+ = 6.25%, C = 12.5%  
(2/2022, No. student = 17); A = 47.06%, B+ = 23.53%, B = 17.65%, C+ = 5.88%, C = 5.88%  
(2/2023, No. student = 32); A = 31.25%, B+ = 15.63%, B = 6.25%, C+ = 12.5%, C = 15.63%

### Teaching Schedule 2<sup>nd</sup> Semester of Academic Year 2024

Week	Date	Topic	Hour		Instructor
			Lecture	Lab	
1	6 Jan	Course Introduction and orientation Overview of the fundamentals of chemistry	2	0	SC
2	13 Jan	Overview of the fundamentals of chemistry	2	0	SC
3	20 Jan	Basic Phytochemistry Concepts and Trends in Herbal Products	2	0	SC
4	27 Jan	Biosynthetic pathway in plants	2	0	SC
5	3 Feb	Biosynthetic pathway in plants	2	0	SC
6	10 Feb	Biosynthetic pathway in plants	2	0	SC
7	17 Feb	Biosynthetic pathway in plants	2	0	SC
8	24 Feb	Biosynthetic pathway in plants	2	0	SC
<b>Midterm examination (content up to week 8)</b>					
10	10 Mar	Sample inspection, collection, and preparation techniques Extraction techniques	2	0	SC
11	17 Mar	Extraction techniques	2	0	SC
12	24 Mar	Separation techniques	2	0	SC
13	31 Mar	Analytical techniques	2	0	SC
14	7 Apr	No class (Holidays)	-	-	-
15	14 Apr	No class (Holidays)	-	-	-
16	21 Apr	Current trends and topics in phytochemistry and herbal product (products)	2	0	SC and Special Instructor (Online)
<b>Final examination (overall content)</b>					