

Course Code and Course Title	English SCIN 495 Independent Study in Bioinnovation Thai วิชา ๔๙๕ การค้นคว้าอิสระทางชีวนวัตกรรม
Number of Credits	2 (0-6-2)
Curriculum and Course Type	Program of Study Bachelor's Degree Program in Science and Technology (International Program, Multidisciplinary Program) Course Type Major Elective Course
Course Coordinator	Asst. Prof. Siriyupa Netramai, Ph.D Address: School of Bioinnovation and Bio-based Product Intelligent, Faculty of Science, Mahidol University Tel: n/a email: siryupa.net@mahidol.edu
Semester/Year of Study	Academic Year 2024 First Semester (1/2024) / Third or Fourth Year
Prerequisite	SCIN 291 and SCIN 292 or SCIN 291 and SCIN 295
Co-requisite	None
Day/Time/Study Site Location	Friday / 9:30AM-4.30PM / Online/On campus SC1-353, Faculty of Science, Mahidol University, Salaya Campus / Zoom
Google Classroom Link	https://classroom.google.com/c/Njk2NzY4NDgxMzgy
Google Classroom Code	will be provided upon successful registration
Date of Latest Revision	22 June 2024

Course Learning Outcomes (CLOs)

This independent study session focuses on **the science and applications of food fabrication**. After successful completion of this course, students must:

1. Create food product that is innovative, sustainable, and scalable
2. Exhibit the ability to work effectively in teams to manage and complete the product development project
3. Produce a detailed final report in the form of a manuscript for a scientific journal, an international conference paper, a petty patent application, or a grant proposal

Objectives of Development / Revision

To revise for new academic year

Course Description

The independent research and learning of topics in the bioinnovation-related field, focusing on food fabrication, under the supervision of faculty members; practical skills in both oral and writing; final study reports and presentations by the end of the semester. The topics include overview of food fabrication, product development, and food processing and preservation; 3D food printing; molecular gastronomy; innovative ingredient sourcing; texture and flavor modification; packaging technology; edible packaging; mathematical

modeling; nutritional analysis; IRB review application; patent filing; technical writing and communication; and food fabrication prototype development.

Credit Hours / Trimester

Theory (Hours)	Addition Class (Hours)	Laboratory/Field trip/ Internship (Hours)	Self-study (Hours)
-	-	90 Hours/Semester (6 Hours x 15 Weeks)	30 Hours/Semester (2 Hours x 15 Weeks)

Number of Hours per Week for Individual Advice

1 hours per week or student requirement during prescribed date and time

Evaluation of the CLOs

Course Learning Outcomes	Measurement Method			Weight (%)
	Class Participation, Peer Evaluation, Instructor observation	Term Project	Manuscript	
CLO1 Create food product that is innovative, sustainable, and scalable	-	30%	10%	40%
CLO2 Exhibit the ability to work effectively in teams to manage and complete the product development project	20%	-	-	20%
CLO3 Produce a detailed final report in the form of a manuscript for a scientific journal, an international conference paper, a petty patent application, or a grant proposal	-	10%	30%	40%
Total	20%	40%	40%	100%

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 50	50-54.99	55-59.99	60-64.99	65-69.99	70-74.99	75-79.99	80-100
Grade	F	D	D+	C	C+	B	B+	A

Teaching Schedule 1st Semester of Academic Year 2024

Week	Date	Topic	Number of Hours		Instructor
			Lecture	Laboratory	
1	9 Aug. 2024	- Course introduction - Overview of food fabrication	0	6	SN
2	16 Aug. 2024	Overview of product development	0	6	SN
3	23 Aug. 2024	Overview of food processing and preservation	0	6	SN
4	30 Aug. 2024	3D food printing	0	6	TK/SN
5	6 Sep. 2024	Molecular gastronomy	0	6	SN
6	13 Sep. 2024	Innovative ingredient sourcing	0	6	SN
7	20 Sep. 2024	Texture and flavor modification	0	6	SN
8	27 Sep. 2024	- Packaging technology - Edible packaging	0	6	SN
Midterm examination (30 Sep.-4 Oct. 2024)					
10	11 Oct. 2024	- Mathematical modeling - Nutritional analysis	0	6	TK/SN
11	18 Oct. 2024	- IRB review application - Patent filing - Technical writing and communication	0	6	SN/MM/TK
12	25 Oct. 2024	Food fabrication prototype development	0	30	SN/TK
13	1 Nov. 2024				
14	8 Nov. 2024				
15	15 Nov. 2024				
16	22 Nov. 2024				
17	29 Nov. 2024	Student presentation	0	6	Instructors from the Faculty of Science, MU
Final examination (2-13 Dec. 2024)					

* Friday 9.30AM-4.30PM Online/On campus Faculty of Science, Mahidol University, Salaya Campus

Instructors

1. MM – Mankeaw Muanchart, Department of Intellectual Property
2. SN – Asst. Prof. Siriyupa Netramai, Ph.D., SCIN
3. TK – Thitisilp Kijchavengkul, Ph.D., SCIN