Course Code and Course Title	English SCIN 291 Food and Agri-technology for Urbanization Thai วทนว ๒๙๑ เทคโนโลยีการอาหารและการเกษตรเพื่อความเป็นเมือง
Number of Credits	3 (3-0-6)
Curriculum and Course Type	Program of Study Bachelor's Degree Program in Science and Technology (International Program, Multidisciplinary Program) Course Type Core course
Course Coordinator	Thitisilp Kijchavengkul, Ph.D. Address: School of Bioinnovation and Bio-based Intelligence, Room SC1-306 Faculty of Science Building 1, Mahidol University, Salaya Campus Tel: 090-986-5764 email: thitisilp.kij@mahidol.edu
Semester/Year of Study	Academic Year 2022 First Semester (1/2022) / Second Year
Prerequisite	None
Co-requisite	None
Day/Time/Study Site Location	Thursday / 09.30 AM.-12.30 PM. Faculty of Science, Mahidol University, Salaya Campus
Date of Latest Revision	**21July 2022**

Course Learning Outcomes (CLOs)

After successful completion of this course, students are able to

1. Associate current global changes and/or problems with urbanization or climate change
2. Explain concepts of sustainability and food security.
3. Apply appropriate sustainable technology and/or innovation to particular problems related to urbanization or climate changes

Objectives of Development / Revision

To propose the new program.

Course Description

Urbanization and modernization; climate changes and limitation of agricultural farm land; food security; Increasing quality and productivity of food and agricultural products supplied for urbanization; precision agriculture; urban farming; dynamic innovation in agriculture and food technologies.

Credit Hours / Trimester

Theory (Hours)	Addition Class (Hours)	Laboratory/Field trip/ Internship (Hours)	Self-study (Hours)
45 Hours/Semester (3 Hours x 15 Weeks)	-	-	90 Hours/Semester (6 Hours x 15 Weeks)

Number of Hours per Week for Individual Advice

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

Evaluation of the CLOs

Course Learning Outcomes		Measurement Method			Weight (%)
		Class Attendance, Participation and Behavior in Class	Written Exam	Class Project	
CLO1	Associate current global changes and/or problems with urbanization or climate change.	5%	15%	10%	30%
CLO2	Explain concepts of sustainability and food security.	-	15%	10%	25%
CLO3	Apply appropriate sustainable technology and/or innovation to particular problems related to urbanization or climate changes.	5%	30%	10%	45%
	Total	**10%**	**60%**	**30%**	**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 20	20-29	30-39	40-49	50-59	60-69	70-79	80-100
Grade	F	D	D+	C	C+	B	B+	A

Teaching Schedule 1nd Semester of Academic Year 2021

Week	Date	Topic	Number of Hours		Instructor
			Lecture	Laboratory	
1	11 Aug 22	Course introduction Urbanization and modernization	3	0	Thitisilp Kijchavengkul, Ph.D.
2	18 Aug 22	Limitation of agricultural farmland	3	0	Thitisilp Kijchavengkul, Ph.D.
3	25 Aug 22	Climate change	3	0	Thitisilp Kijchavengkul, Ph.D.
4	1 Sep 22	Sustainability I	3	0	Thitisilp Kijchavengkul, Ph.D.
5	8 Sep 22	Sustainability II	3	0	Thitisilp Kijchavengkul, Ph.D.
6	15 Sep 22	Food security	3	0	Asst. Prof. Siriyupa Netramai, Ph.D.
	TBA*	Open-book examination			
7	22 Sep 22	Increasing quality and productivity of food and agricultural products supplied for urbanization I	3	0	Asst. Prof. Siriyupa Netramai, Ph.D.
8	29 Sep 22	Increasing quality and productivity of food and agricultural products supplied for urbanization II	3	0	Asst. Prof. Siriyupa Netramai, Ph.D.
Midterm examination (3-7 October, 2022)					
9	20 Oct 22	Increasing quality and productivity of food and agricultural products supplied for urbanization III	3	0	Asst. Prof. Siriyupa Netramai, Ph.D.
10	27 Oct 22	Precision agriculture	3	0	Asst. Prof. Watcharra Chintakovid, Ph.D.
11	3 Nov 22	Artificial environment and microclimate technology	3	0	Asst. Prof. Watcharra Chintakovid, Ph.D.
12	10 Nov 22	Dynamic innovation in agriculture and food technologies I	3	0	Asst. Prof. Siriyupa Netramai, Ph.D.
13	17 Nov 22	Dynamic innovation in agriculture and food technologies II	3	0	Asst. Prof. Siriyupa Netramai, Ph.D.
14	24 Nov 22	Dynamic innovation in agriculture and food technologies III	3	0	Thitisilp Kijchavengkul, Ph.D.
15	1 Dec 22	Dynamic innovation in agriculture and food technologies III	3	0	Thitisilp Kijchavengkul, Ph.D.
Final examination (29 November - 25 December, 2021)					

*To be announced