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| Course Code and Course Title | English SCIN 291 Food and Agri-technology for UrbanizationThai 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 2021 First Semester **(1/2021) / 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 | **11 July 2021** |

**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 | - | - | 90 Hours/Semester |
| (3 Hours x 15 Weeks) |  |  | (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.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | 19 Aug 21 | Course introductionUrbanization and modernization | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| 2 | 26 Aug 21 | Limitation of agricultural farmland | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| 3 | 2 Sep 21 | Climate change | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| 4 | 9 Sep 21 | Sustainability I | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| 5 | 16 Sep 21 | Sustainability II | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| 6 | 23 Sep 21 | Food security | **3** | **0** | **Asst. Prof. Siriyupa Netramai, Ph.D.** |
|  | TBA\* | Open-book examination I |  |  |  |
| 7 | 30 Sep 21 | Increasing quality and productivity of food and agricultural products supplied for urbanization I | **3** | **0** | **Asst. Prof. Siriyupa Netramai, Ph.D.** |
| **Midterm examination (4-8 October, 2021)** |
| 8 | 14 Oct 21 | Increasing quality and productivity of food and agricultural products supplied for urbanization II | **3** | **0** | **Asst. Prof. Siriyupa Netramai, Ph.D.** |
| 9 | 21 Oct 21 | Increasing quality and productivity of food and agricultural products supplied for urbanization III | **3** | **0** | **Asst. Prof. Siriyupa Netramai, Ph.D.** |
| 10 | 28 Oct 21 | Precision agriculture | **3** | **0** | **Asst. Prof. Watcharra Chintakovid, Ph.D.** |
| 11 | 4 Nov 21 | Artificial environment and microclimate technology | **3** | **0** | **Asst. Prof. Watcharra Chintakovid, Ph.D.** |
|  | TBA\* | Open-book examination II |  |  |  |
| 12 | 11 Nov 21 | Dynamic innovation in agriculture and food technologies I | **3** | **0** | **Asst. Prof. Siriyupa Netramai, Ph.D.** |
| 13 | 18 Nov 21 | Dynamic innovation in agriculture and food technologies II | **3** | **0** | **Asst. Prof. Siriyupa Netramai, Ph.D.** |
| 14 | 25 Nov 21 | Dynamic innovation in agriculture and food technologies III | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| 15 | TBA\* | Dynamic innovation in agriculture and food technologies III | **3** | **0** | Thitisilp Kijchavengkul, Ph.D. |
| **Final examination (29 November - 25 December, 2021)** |

\*To be announced