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| Course Code and Course Title | English SCIN 262 Materials Science and Applications Thai วิชา ๒๖๒ วัสดุศาสตร์และการนำไปใช้ |
| 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 Specific 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: siriyupa.net@mahidol.ac.th |
| Semester/Year of Study | Academic Year 2020 Second Semester (2/2020) / Second Year |
| Prerequisite | None |
| Co-requisite | None |
| Day/Time/Study Site Location | Wednesday / 9.30AM-12.30PM / Online/On campus Faculty of Science, Mahidol University, Salaya Campus |
| Date of Latest Revision | 4 January 2021 |

Course Learning Outcomes (CLOs)

After successful completion of this course, students are able to

1. Explain important properties, processing, fabrications, applications, and waste management of selected materials
2. List crucial materials' properties required for specific applications in agriculture, and pharmaceutical- and food industries
3. Select appropriate material(s) to be used in particular application(s) in agriculture, and pharmaceutical- and food industries

Objectives of Development / Revision

To propose the new program

Course Description

Properties, processing, fabrications, applications, and waste management of materials, including plant fibers, woods, papers, glass, metals, polymers, nanomaterials, biodegradable materials, and stimuli-responsive materials, used in the daily life, agriculture, and pharmaceutical- and food industries.



School of Bioinnovation and Bio-based Product Intelligence (SCIN)
 Program in Bioinnovation (International Program, Multidisciplinary Program)
 Course: SCIN 262 Materials Science and Applications

Degree Bachelor Master Doctoral
 Faculty of Science

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

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

Evaluation of the CLOs

| Course Learning Outcomes | Measurement Method | | | | Weight (%) |
|--|---------------------|--------------|------------|--------------|-------------|
| | Class Participation | Written Exam | Assignment | Presentation | |
| CLO1 Explain important properties, processing, fabrications, applications, and waste management of selected materials | 5% | 20% | 10% | - | 25% |
| CLO2 List crucial materials' properties required for specific applications in agriculture, and pharmaceutical- and food industries | 5% | 20% | 10% | - | 35% |
| CLO3 Select appropriate material(s) to be used in particular application(s) in agriculture, and pharmaceutical- and food industries | 5% | 10% | 10% | 5 | 30% |
| Total | 15% | 50% | 30% | 5% | 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 |



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Teaching Schedule 2nd Semester of Academic Year 2020

| Week | Date | Topic | Number of Hours | | Instructor |
|---|--------------|--|-----------------|------------|-------------------------------|
| | | | Lecture | Laboratory | |
| 1 | 20 Jan. 2021 | - Course introduction - History of man-made materials | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 2 | 27 Jan. 2021 | Leaf, plant fibers, & woods: Properties, processing, applications, and degradation | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 3 | 3 Feb. 2021 | Papers & paperboards: Properties, processing, applications, and degradation | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 4 | 10 Feb. 2021 | Glass: Properties, processing, applications, and degradation | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 5 | 17 Feb. 2021 | Metals: Properties, processing, applications, and degradation | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| Speed test I | | | | | |
| 6 | 24 Feb. 2021 | Polymers: Properties, processing, applications, and degradation | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 7 | 3 Mar. 2021 | | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 8 | 10 Mar. 2021 | | 3 | 0 | Dr. Thitisilp Kijchavengkul |
| 9 | 24 Mar. 2021 | Material testing | 3 | 0 | Asst. Prof. Siriyupa Netramai |
| 10 | 31 Mar. 2021 | Nanomaterials: Properties, processing, and applications | 3 | 0 | Dr. Thitisilp Kijchavengkul |
| 11 | 7 Apr. 2021 | | 3 | 0 | Dr. Thitisilp Kijchavengkul |
| Speed test II | | | | | |
| 12 | TBA | Nanomaterials: Properties, processing, and applications | 3 | 0 | Invited speaker |
| 13 | 21 Apr. 2021 | Compostable & biodegradable materials: Properties, processing, and applications | 3 | 0 | Dr. Thitisilp Kijchavengkul |
| 14 | 28 Apr. 2021 | Stimuli-responsive materials: Properties, processing, and applications | 3 | 0 | Invited speaker |
| 15 | 5 May 2021 | Material waste management | 3 | 0 | Dr. Thitisilp Kijchavengkul |
| Final examination (10-21 May 2021) | | | | | |

* Wednesday 9.30AM-12.30PM Online/On campus Faculty of Science, Mahidol University, Salaya Campus