

**SCME 263 Nanobiotechnology (3 credit)**

Academic Year 2021//semester1

**Class Schedule:** Friday (9:30-12:20 pm)**Room:** Online Class

Google Class Code: fmyfx4g

<https://classroom.google.com/c/MzY4ODIyNDQ1MjMy?cjc=fmyfx4g>**Course Coordinator:** Assoc. Prof. Dr. Dakrong PissuwanContact details: email: [dakrong.pis@mahidol.ac.th](mailto:dakrong.pis@mahidol.ac.th)

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**Instructors:**

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For consultation relating to this course, please contact the instructor and arrange a time for meeting if necessary. In the case of contacting guest lecturers, please do it through course coordinator. The course will run online for the whole course to reduce the chance of Covid-outbreak.

**Course Description:** This course introduces students to understand the relationship between biological system and nanotechnology and how to engineer the behavior of molecules at the nano-scale, concepts of nanobiotechnology and its applications in biosensing, biomedical engineering, material application, drug release, diagnostics, food, environment, and public health. Material properties used in nanobiotechnology will be included.

**Grading Policy:** Course assessment will be based on the following:

*Attendance: 10%*

Students must attend all classes for receiving a full mark, and 80% of classes overall to pass. Late (> 15 min) will be recorded as absence.

*Quizzes and class activities before midterm examination 30% (for weeks 1, 2, 3, 7)*

*Midterm Examination 20%*

There will be questions from week 4, 5, 6, 8 lectures

*Quizzes or Assignments and class activities after midterm examination 10% (for weeks 13, 15)*

*Final Examination 30%*

There will be questions from week 9,10, 11, 12, 12 lectures

The final grade given will be based on letter scale (A, B<sup>+</sup>, B, C<sup>+</sup>, C, D<sup>+</sup>, D, F). In order to pass the course, you must achieve an overall mark of at least 50%.

### **Reference Materials**

1. David Andrew Phoenix and Waqar Ahmed, Nanobiotechnology, Manchester: One Central Press Ltd, 2014.
2. Other material as indicated by instructors

**Class Schedule SCME263, Subject Coordinator:** Assoc. Prof. Dakrong Pissuwan

<b>Date</b>	<b>Week</b>	<b>Topic</b>	<b>Instructor</b>
13-August-21	1	Overview: Nanobiotechnology	Assoc. Prof. Dr. Dakrong Pissuwan
20-August-21	2	Nanobiotechnology and cell biology	Assoc. Prof. Dr. Dakrong Pissuwan
27-August-21	3	Biological materials and biomaterials used in nanobiotechnology	Assoc. Prof. Dr. Dakrong Pissuwan
3-September-21	4	Basic of molecular and chemical interaction, molecular recognition, and assembly of biological structure	Dr. Nungnit Wattanavichain
10-September-21	5	Nanobiointerface	Dr. Nungnit Wattanavichain
17-September-21	6	Nanoparticles and the immune system	Asst. Prof.Dr. Kanlaya Prapainop
24-September-21	7	Synthesis of nanomaterials	Assoc. Prof. Dr. Dakrong Pissuwan
1-October-21	8	Nanostructures in drug controlled Release	Dr. Nisa Patikarnmonthon
		<b>Midterm examination October 4-8, 2021</b>	
15-October-21	9	Nano printing of DNA, RNA, and proteins biochips applications in nano scale detection Lab-on-a-chip devices (LOC)	Dr. Nungnit Wattanavichain
22-October-21	10	Nanoparticles in food application	Dr. Nungnit Wattanavichain
29-October-21	11	Nanoparticles in biological labeling and cellular imaging: Science of nanoparticles functionalization	Dr. Nungnit Wattanavichain
5-November-21	12	Nanomaterials: Waste utilization and waste treatment	Dr. Nungnit Wattanavichain
12-November-21	13	Nanoparticles in agricultural application	Assoc. Prof. Dr. Dakrong Pissuwan
19-November-21	14	Nanoparticles and public health	Dr. Nungnit Wattanavichain
26-November-21	15	Microbiome application	Dr. Bungonsiri Intra
		<b>Final examination</b>	