

SCME 263 Nanobiotechnology (3 credit)

Academic Year 2023/semester 1

Class Schedule: Friday (9:30-12:20 pm)**Room:** SC1-154**Google Classroom:** <https://classroom.google.com/c/NjE3MjY5NzA0NTM4?cjc=fdhkwje>**Course Coordinator:** Assoc. Prof. Dr. Dakrong PissuwanContact details: email: 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.

Midterm Examination 50%

There will be questions from week 1-8 lectures

Quizzes or Assignments and class activities after midterm examination 15% (for weeks 9,10,11, 15)

Final Examination 25%

There will be questions from week 12,13,14 lectures

The final grade given will be based on letter scale (A, B⁺, B, C⁺, C, D⁺, 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

Date	Week	Topic	Instructor
11-August-23	1	Basic of molecular and chemical interaction, molecular recognition, and assembly of biological structure	Dr. Nungnit Wattanavichain
18-August-23	2	Nanobiointerface	Dr. Nungnit Wattanavichain
25-August-23	3	Nano printing of DNA, RNA, and proteins biochips applications in nano scale detection Lab-on-a-chip devices (LOC)	Dr. Nungnit Wattanavichain
1-September-23	4	Nanoparticles in biological labeling and cellular imaging: Science of nanoparticles functionalization	Dr. Nungnit Wattanavichain
8-September-23	5	Nanoparticles and the immune system	Asst. Prof. Dr. Kanlaya Prapainop
15-September-23	6	Nanostructures in drug controlled Release	Dr. Nisa Patikarnmonthon
22-September-23	7	Nanoparticles in food application	Dr. Nungnit Wattanavichain
29-September-23	8	Nanomaterials: Waste utilization and waste treatment	Dr. Nungnit Wattanavichain
		Midterm examination October 2-6, 2023	
20-October-23	9	Nanoparticles and public health (Assignment)	Dr. Nungnit Wattanavichain
27-October-23	10	Overview: Nanobiotechnology (Quiz)	Assoc. Prof. Dr. Dakrong Pissuwan
3-November-23	11	Nanobiotechnology and cell biology (Quiz)	Assoc. Prof. Dr. Dakrong Pissuwan
10-November-23	12	Synthesis of nanomaterials	Assoc. Prof. Dr. Dakrong Pissuwan
17-November-23	13	Biological materials and biomaterials used in nanobiotechnology	Assoc. Prof. Dr. Dakrong Pissuwan
24-November-23	14	Nanoparticles in agricultural application	Assoc. Prof. Dr. Dakrong Pissuwan

1-December-23	15	Microbiome application (Assignment)	Dr. Bungonsiri Intra
		Final examination	