

**SCME 263 Nanobiotechnology (3 credit)**

Academic Year 2022/semester1

**Class Schedule:** Friday (9:30-12:20 pm)**Room:** Onsite SC1-156**Google Classroom:** <https://meet.google.com/hoc-agwq-pgz>**Course Coordinator:** Assoc. Prof. Dr. Dakrong PissuwanContact details: email: [dakrong.pis@mahidol.ac.th](mailto:dakrong.pis@mahidol.ac.th)

Office: K554, Phayathai campus

Phone: 022015935

**Instructors:**

1. Assoc. Prof. Dr. Dakrong Pissuwan  
email: [dakrong.pis@mahidol.ac.th](mailto:dakrong.pis@mahidol.ac.th)  
Office: K554, Phayathai campus  
Phone: 022015935
2. Asst. Prof. Dr. Kanlaya Prapainop  
email: [kanlaya.pra@mahidol.edu](mailto:kanlaya.pra@mahidol.edu)  
Office: Pr314, Department of Biochemistry, Phayathai campus  
Phone: 022015604
3. Dr. Nisa Patikarnmonthon  
email: [nisa.pat@mahidol.edu](mailto:nisa.pat@mahidol.edu)  
Office: K536, Phayathai Campus  
Phone: 022015925
4. Asst. Prof. Dr. Bungonsiri Intra  
email: [bungonsiri.int@mahidol.ac.th](mailto:bungonsiri.int@mahidol.ac.th)  
Office: K543, Department of Biotechnology, Phayathai campus  
Phone: 02201 5916
5. Dr. Neungnit Wattanavichein  
email: [n.wattanavichean@gmail.com](mailto:n.wattanavichean@gmail.com)

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.

*Quizzes and class activities before midterm examination 5% (for weeks 1, 2)*

*Midterm Examination 35%*

There will be questions from week 3, 4, 5, 6, 7, 8 lectures

*Quizzes and class activities after midterm examination 20% (for weeks 9, 10, 11)*

*Final Examination 30%*

There will be questions from week 12-15 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>
19 Aug 2022	1	Overview: Nanobiotechnology	Assoc. Prof. Dr. Dakrong Pissuwan
	2	Synthesis of nanomaterials	Assoc. Prof. Dr. Dakrong Pissuwan
26 Aug 2022	3	Nanobiotechnology and cell biology	Dr. Neungnit Wattanavichain
2 Sept 2022	4	Basic of molecular and chemical interaction, molecular recognition, and assembly of biological structure	Dr. Neungnit Wattanavichain
9 Sept 2022	5	Nanoparticles and the immune system Nanopatterning	Asst. Prof. Dr. Kanlaya Prapainop
16 Sept 2022	6	Nanopatterning	Dr. Neungnit Wattanavichain
23 Sept 2022	7	Nanostructures in drug controlled Release	Dr. Nisa Patikarnmonthon
30 Sept 2022	8	Nano printing of DNA, RNA, and proteins biochips applications in nano scale detection Lab-on-a-chip devices (LOC)	Dr. Neungnit Wattanavichain
		<b>Midterm examination October 3-7, 2022</b>	
21 Oct 2022	9	Nanoparticles in biological labelling and cellular imaging: Science of nanoparticles functionalization	Dr. Neungnit Wattanavichain
28 Oct 2022	10	Nanomaterials: Waste utilization and waste treatment	Dr. Neungnit Wattanavichain
4 Nov 2022	11	Microbiome application	Asst. Prof. Dr. Bungonsiri Intra
11 Nov 2022	12	Nanoparticles in food application	Dr. Neungnit

			Wattanavichein
18 Nov 2022	13	Nanoparticles in packaging	Assoc. Prof. Dr. Dakrong Pissuwan
25 Nov 2022	14	Nanoparticles in agricultural application	Assoc. Prof. Dr. Dakrong Pissuwan
2 Dec 2022	15	Effect of nanotechnology on health and environment	Assoc. Prof. Dr. Dakrong Pissuwan
		<b>Final examination December 6-16 2022</b>	