

SCME 381 Research Laboratory in Materials Science and Nano Engineering I (1 credit)

Academic Year 2023

Class Schedule: Friday afternoons (1:30-4:20 pm)

Room: SC1-255 (lab), SC1-156 (lecture room)

Coordinator: Assoc. Prof. Rakchart Traiphol (email: rakchart.tra@mahidol.ac.th)

Instructors: Assoc. Prof. Rakchart Traiphol (email: rakchart.tra@mahidol.ac.th)
Dr. Tanant Waritanant (email: tanant.war@mahidol.edu)
Asst. Prof. Nungnit Wattanavichean (email: nungnit.wat@mahidol.ac.th)

Course Description: This course aims to impart knowledge about the preparation and characterisation of several important classes of materials. Students will undertake a series of practical experiments, and interpret and share results by way of report writing, group discussions, and class presentations.

Grading Policy: Student evaluation is in accordance with the rules and regulations of the Faculty of Science, Mahidol University. Letter grades of A, B+, B, C+, C, D+, D, and F will be given according to the student's score. Course assessment will be based on the following:

Attendance/Participation	35%
Assignments/reports	35%
Presentation	30%

Reference Materials

Materials as given by instructors

Class Schedule

Week date	Topic	Hours	Teaching Methods/multimedia	Instructor
1 11/8/23	Introduction, orientation and safety precautions	3	Activities: Lecture class Media: PowerPoint Presentation	Assoc.Prof Rakchart
2 18/8/23	Synthesis of ZnO nanoparticles: Effects of precursors and solvent media	3	Activities: Laboratory Media: PowerPoint Presentation	Assoc.Prof Rakchart
3 25/8/23	Synthesis and characterization of polydiacetylene (PDA) and ZnO nanocomposites	3	Activities: Laboratory Media: PowerPoint Presentation	Assoc.Prof Rakchart
4 1/9/23	Synthesis and characterization of polydiacetylene (PDA) and ZnO nanocomposites	3	Activities: Discussion Media: PowerPoint Presentation	Assoc.Prof Rakchart
5 8/9/23	Lab discussion/presentation/the utilization of ZnO nanoparticles and PDA/ZnO nanocomposites in different aspects	3	Activities: Discussion Media: PowerPoint Presentation	Assoc.Prof Rakchart
6 15/9/23	Tensile testing of thermosetting/thermoplastic/elastomer	3	Activities: Discussion Media: PowerPoint Presentation	Assist. Prof. Nungnit
7 22/9/23	Lab discussion/presentation/ the utilization of these polymers	3	Activities: Laboratory Media: PowerPoint Presentation	Assist. Prof. Nungnit
Oct 2-6, 2023	Mid-term			
9 13/10/23	Biomaterials fabrication and characterization	3	Activities: Laboratory Media: PowerPoint Presentation	Assist. Prof. Nungnit
10 20/10/23	Lab discussion/presentation/ the utilization of biomaterials	3	Activities: Discussion Media: PowerPoint Presentation	Assist. Prof. Nungnit
11 27/10/23	Crystal optics – optical anisotropy, materials birefringence, refractive indices, and Brewster's angle	3	Activities: Discussion Media: PowerPoint Presentation	Dr. Tanant
12 3/11/23	Optical fiber – Optical fiber materials and internal structure, single and multimode optical fiber, numerical aperture	3	Activities: Laboratory Media: PowerPoint Presentation	Dr. Tanant
14 10/11/23	Lab discussion/presentation/ the utilization of these optical phenomenon	3	Activities: Laboratory Media: PowerPoint Presentation	Dr. Tanant
Dec 4- 15, 2023	Final exam			