Course Syllabus
SCBM 121 Cell and Molecular Biology
Academic Year 2025

Course ID and Name: SCBM 121 Cell and Molecular Biology
Course Coordinator: Thaned Kangsamaksin, Ph.D.
Instructors:
1. Kornkamon Lertsuwan, Ph.D., Department of Biochemistry (KL)
2. Mikhail Khvochtchev, Ph.D., Department of Biochemistry (MK)
3. Ornchuma Itsathitphaisarn, Ph.D., Department of Biochemistry (OI)
4. Sittinan Chanarat, Ph.D., Department of Biochemistry (SC)
5. Thaned Kangsamaksin, Ph.D., Department of Biochemistry (TK)
6. Utid Suriya, Ph.D., Department of Biochemistry (US)

Teaching Assistant: TBA

Credits: 2 (2-0-4)
Curricula: Bachelor of Science Program in Biomedical Science
Bachelor of Science Program in Materials Science and Nano Engineering
Bachelor of Engineering Program in Biomedical Engineering

Semester: Second semester
Prerequisite: None

Course Description
Cell structure and function; chemistry of the cell; information flow in the cell; cell division and growth; cell cycle; cell differentiation; intracellular and intercellular communication; signal transduction and cell signaling

Venue:
Faculty of Science, Salaya Campus, Room SC1-152

Lecture	Date	Time	Topic	Instructor
1	Jan 9, 2026	9:30 – 11:30	Introduction to the cell	OI
2	Jan 16, 2026	9:30 – 11:30	Chemistry of the cell I – protein structure and function	OI
3	Jan 23, 2026	9:30 – 11:30	Chemistry of the cell II – genes and chromosomes	OI
4	Jan 30, 2026	9:30 – 11:30	Membrane structure and transport	MK
5	Feb 6, 2026	9:30 – 11:30	Intracellular compartments and trafficking	MK
6	Feb 13, 2026	9:30 – 11:30	Cell motility and shape – cytoskeleton	KL
7	Feb 20, 2026	9:30 – 11:30	Cell in the social context I – cell adhesions	KL
8	Feb 27, 2026	9:30 – 11:30	Q/A	OI,MK,KL,TA
Mar 2–6, 2026: Mid-Term Examination				
9	Mar 13, 2026	9:30 – 11:30	Cell in the social context II – signaling pathways	US
10	Mar 20, 2026	9:30 – 11:30	Cell cycle – regulation and checkpoints	SC
11	Mar 27, 2026	9:30 – 11:30	Cell cycle II – cell growth and apoptosis	SC
12	Apr 3, 2026	9:30 – 11:30	Cell division – mitosis and meiosis	SC
13	Apr 10, 2026	9:30 – 11:30	Basic stem cell concepts	TK
14	Apr 17, 2026	9:30 – 11:30	Basic cancer cell biology	TK
15	Apr 24, 2026	9:30 – 11:30	Q/A	US,SC,TK,TA
Apr 27–May 8, 2026: Final Examination				

Text Book: Alberts B., et al. *Molecular Biology of the Cell*.

Course Learning Outcomes (CLOs)

Upon completion of this course, students are able to:

1. Describe the definition of a cell and its components
2. Compare and contrast the characteristics and functions of cellular biomolecules
3. Describe the functions of genetic materials
4. Describe the structure and function of the plasma membrane and compare and contrast different modes of transport across the plasma membrane
5. Describe the components and functions of cellular organelles
6. Describe the processes involved in cell shape and movement
7. Describe the processes involved in the interaction of a cell and its extracellular environment
8. Describe the definition of cell communication and signal transduction
9. Describe the definition of the cell cycle including its regulation and check points
10. Describe the process of cell growth and programmed cell death
11. Compare and contrast the processes of mitosis and meiosis
12. Explain the definition and properties of stem cells
13. Describe the basic characteristics of cancer cells

Course Assignments

1. Reading assignments by instructors

Assessment Criteria

Written examination

Midterm (Lec 1–6)	36 %
Final (Lec 7–13)	42 %
Participation and assignments	22 %

Appeal Procedure

Should the students have any appeal regarding the assessments or grade, inquiry can be made to the course coordinator immediately via email (thaned.kan@mahidol.ac.th).