

**Course Syllabus**  
**SCBM 121 Cell and Molecular Biology**  
**Academic Year 2024**

**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 Itsathitphisarn, Ph.D., Department of Biochemistry (OI)
4. Sittinan Chanarat, Ph.D., Department of Biochemistry (SC)
5. Thaned Kangsamaksin, Ph.D., Department of Biochemistry (TK)

**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 **TBA**

Lecture	Date	Time	Topic	Instructor
1	Jan 17, 2025	9:30 – 11:30	Introduction to the cell	OI
2	Jan 24, 2025	9:30 – 11:30	Chemistry of the cell I – protein structure and function	OI
3	Jan 31, 2025	9:30 – 11:30	Chemistry of the cell II – genes and chromosomes	OI
4	Feb 7, 2025	9:30 – 11:30	Membrane structure and transport	MK
5	Feb 14, 2025	9:30 – 11:30	Intracellular compartments and trafficking	MK
6	Feb 21, 2025	9:30 – 11:30	Cell motility and shape – cytoskeleton	KL
7	Feb 28, 2025	9:30 – 11:30	Cell in the social context I – cell adhesions	KL
Mar 3–7, 2025: Mid-Term Examination				
8	Mar 14, 2025	9:30 – 11:30	Cell in the social context II – signaling pathways	KL
9	Mar 21, 2025	9:30 – 11:30	Cell cycle – regulation and checkpoints	SC
10	Mar 28, 2025	9:30 – 11:30	Cell cycle II – cell growth and apoptosis	SC
11	Apr 4, 2025	9:30 – 11:30	Cell division – mitosis and meiosis	SC
12	Apr 11, 2025	9:30 – 11:30	Basic stem cell concepts	TK
13	Apr 18, 2025	9:30 – 11:30	Basic cancer cell biology	TK
14	Apr 25, 2025	9:30 – 11:30	Q/A	KL,SC,TK,TA
Apr 28–May 19, 2025: 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](mailto:thaned.kan@mahidol.ac.th)).