

Course Syllabus
SCBM 121 Cell and Molecular Biology
Academic Year 2020

Course ID and Name: SCBM 121 Cell and Molecular Biology

Course Coordinator: Thaned Kangsamaksin, Ph.D.

Instructors:

1. Ornchuma Itsathitphaisarn, Ph.D., Department of Biochemistry (OI)
2. Sittinan Chanarat, Ph.D., Department of Biochemistry (SC)
3. Patompon Wongtrakongate, Ph.D., Department of Biochemistry (PW)
4. Mikhail Khvochtchev, Ph.D., Department of Biochemistry (MK)
5. Kornkamon Lertsuwan, Ph.D., Department of Biochemistry (KL)
6. Thaned Kangsamaksin, Ph.D., Department of Biochemistry (TK)

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

Lecture	Date	Time	Topic	Instructor
1	Jan 8, 2021	9:30 – 11:30	Introduction to the cell	OI
2	Jan 15, 2021	9:30 – 11:30	Chemistry of the cell I – protein structure and function	OI
3	Jan 22, 2021	9:30 – 11:30	Chemistry of the cell II – genes and chromosomes	OI
4	Jan 29, 2021	9:30 – 11:30	Cell cycle – regulation and checkpoints	SC
5	Feb 5, 2021	9:30 – 11:30	Cell cycle II – cell growth and apoptosis	SC
6	Feb 12, 2021	9:30 – 11:30	Cell division – mitosis and meiosis	SC
7	Feb 19, 2021	9:30 – 11:30	Basic stem cell concepts	PW
8	Feb 26, 2021	9:30 – 11:30	Conference	OI,SC,PW,TK
Mar 1–5, 2021: Mid-Term Examination				
9	Mar 12, 2021	9:30 – 11:30	Membrane structure and transport	MK
10	Mar 19, 2021	9:30 – 11:30	Cell communication	MK
11	Mar 26, 2021	9:30 – 11:30	Intracellular compartments – organelles	MK
12	Apr 2, 2021	9:30 – 11:30	Cell motility and shape – cytoskeleton	KL
13	Apr 9, 2021	9:30 – 11:30	Cell in the social context I – cell adhesions	KL
14	Apr 23, 2021	9:30 – 11:30	Cell in the social context II – signaling pathways	KL
15	Apr 30, 2021	8:30 – 11:30	Cancer cell biology	TK
May 3–14, 2021: 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 material
4. Describe the definition of the cell cycle including its regulation and check points
5. Describe the process of cell growth and programmed cell death
6. Compare and contrast the processes of mitosis and meiosis
7. Explain the definition and properties of stem cells
8. Describe the structure and function of the plasma membrane and compare and contrast different modes of transport across the plasma membrane
9. Describe the definition of cell communication and signal transduction
10. Describe the components and functions of cellular organelles
11. Describe the processes involved in cell shape and movement
12. Describe the processes involved in the interaction of a cell and its extracellular environment
13. Describe the characteristics of cancer cells

Course Assignments

1. Reading assignments by instructors

Assessment Criteria

Written examination

Midterm 45 %

Final 45 %

Conference activities 10 %

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).