

Course Syllabus

1. **Program of Study** Bachelor of Science (Biological Sciences)
Faculty/Institute/College Mahidol University International College
2. **Course Code** ICBI 216
Course Title Cell Biology
3. **Number of Credits** 4 (4-0-8) (Lecture/Lab/Self-study)
4. **Prerequisite (s)** None
5. **Type of Course** major core; minor required
6. **Trimester/ Academic Year**
Second trimester/every academic year
7. **Course Condition**
None

8. Course Description

Analysis of the structures and functions of cells, cell action, especially the fundamental relationships between structure and function at the cellular and molecular levels.

9. Course Objective (s)

1. To understand general cell structure, subcellular structure, subcellular organelles and their molecular composition.
2. To correlate cellular structure and function in general.
3. To be familiar with general principle of microscopes and microscopic techniques.
4. To be able to set hypotheses about biological phenomenon at a cellular level.
5. To outline principles and localized major chemical reactions at subcellular levels.
6. To understand how cells cooperate in the physiology of nervous system, muscle system, and immune system.
7. Getting to know and appreciate some autobiography of prominent cell biologists.
8. Having capacity and motivation to read more advanced text books on cell biology and also some details in scientific articles in current scientific journals.
9. Develop critical thinking by doing some problem solving in class.
10. Being exposed to current job market in biological sciences.

10. Course Outline

| week | Topics/Seminar | Hours | | | Instructor |
|------|---|---------|-----|------------|--------------------------------|
| | | Lecture | Lab | Self-study | |
| 1 | Welcome to cell biology Fundamental living unit Small molecules and | 4 | 0 | 8 | Dr. Sujinda Dr. Saovanee |

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|--------------------------|--|----|---|----|--|
| | macromolecules of the cells | | | | |
| 2 | Subcellular structure and subcellular compartments : visualization of cells and underlying cell structure and function relationships | 4 | 0 | 8 | |
| 3 | Cell membrane structure and surface Cell membrane transport | 4 | 0 | 8 | |
| 4 | Cell skeletons and cell differentiation : cell shape and specialization Energy, catalysis and biosynthesis | 4 | 0 | 8 | |
| 5 | How cells obtain energy from food | 4 | 0 | 8 | |
| 6 | Reviews and Midterm examination | 4 | 0 | 8 | |
| 7 | Energy generation in mitochondria Energy generation in chloroplast | 4 | 0 | 8 | |
| 8 | Cell cycle, cell division and cell death | 4 | 0 | 8 | |
| 9 | Nerve systems Neurotransmitters and their receptor | 4 | 0 | 8 | |
| 10 | Muscle systems | 4 | 0 | 8 | |
| 11 | Immunological defense Reviews | 4 | 0 | 8 | |
| Final examination | | | | | |
| | Total | 44 | 0 | 88 | |

11. Teaching Method (s)

1. Lecture
2. Suggested readings
3. Discussion in class

12. Teaching Media

1. Powerpoint Presentations
2. Texts and teaching materials

13. Measurement and Evaluation of Student Achievement

Student achievement is measured and evaluated by

- 13.1 The ability to understand general cell structure, subcellular structure, subcellular organelles and their molecular composition.
- 13.2 The ability to correlate cellular structure and function in general.
- 13.3 Familiarity with general principle of microscopes and microscopic techniques.
- 13.4 The ability to set hypotheses about biological phenomenon at a cellular level.
- 13.5 The ability to outline principles and localized major chemical reactions at subcellular levels.
- 13.6 The ability to understand how cells cooperate in the physiology of nervous system, muscle system, and immune system.

Student's achievement will be graded according to the college and university standard using the symbols: A, B+, B, C+, C, D+, D and F. Students must attend at least 80% of the total class hours of this course.

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| Ratio of mark | |
| Midterm examination | 40% |
| Final examination | 40% |
| Class attendance and participation and problem sets | 20% |
| Total | 100% |

14. Course evaluation

14.1 Students' achievement as indicated in number 13 above.

14.2 Students' satisfaction towards teaching and learning of the course using questionnaires.

15. Reference (s)

1. Tobin, A.J. and Morec, R.E. Asking about cells. USA. Saunders College Publishing. 1997.
2. Wood E.J. and Smith, C.A.. Cell biology. USA. Chapman & Hall. 1996.
3. Alberts B., Bray D., Hopkin K., Johnson A., Lewis J., Raff M., Roberts K & Walter P. Essential cell biology. 2nd Edition. UK. Garland Publishing, Inc. 2004.
4. Lewin, B., Cassimeris, L., Lingappa, V.R. and Plopper, G. Cells. USA. Jones and Barette Publisher. 2006.

16. Instructor (s)

Assist. Prof. Dr. Sujinda Thanaphum
Assoc. Prof. Saovanee Dharmstithi

17. Course Coordinator

Assist. Prof. Dr. Sujinda Thanaphum
Assoc. Prof. Saovanee Dharmstithi