

## Course Syllabus

1. **Program of Study** Bachelor of Science (Biological Sciences)  
**Faculty?Institute/College** Mahidol University International College
2. **Course Code** ICBI 308  
**Course Title** Molecular Biology
3. **Number of Credits** 4 (4-0-8) (Lecture/Lab/Self-study)
4. **Prerequisite (s)** none
5. **Type of Course** Required course
6. **Trimester/ Academic Year**  
First trimester/ every academic year
7. **Course Condition**  
None

### 8. Course Description

Critical thinking styles, brief of key instruments, reviews on basic function interactions of macromolecules, molecular biology of genes and genomes, genetic engineering and genome analysis.

### 9. Course Objective (s)

1. To use basic molecular biology to understand and describe biological phenomena at all levels of biological organization and complexity especially in relation to students's research interest.
2. To describe properties and relationship of biological, chemical, and physical properties of macromolecules.
3. To describe overviews of important biological processes such as replication, transcription, translation and mutation.
4. To relate biological phenomena at molecular level and evolutionary thinking.
5. To be able to set molecular hypothesis and thinking through the experimental facts.
6. To be able to test experimental result against hypotheses.
7. Describe principles of instrument and key technologies in molecular biology.
8. Discuss biography of some prominent molecular biologists.
9. Read international scientific publications on molecular biology.
10. Consider international job market in molecular biology.
11. Develop sensible attitude toward molecular biology.

### 10. Course Outline

week	Topics/Seminar	Hours			Instructor
		Lecture	Lab	Self-study	
1	- Welcome to molecular biology - Small molecules and	4	0	8	Dr. Sujinda Dr. Grand.

	macromolecules				
2	- Nucleic acids - Protein structure	4	0	8	
3	- Macromolecule interactions - The genetic materials	4	0	8	
4	- DNA replication	4	0	8	
5	- Transcription - Translation	4	0	8	
6	- Reviews and Midterm examination	4	0	8	
7	- Mutation, repair and recombination	4	0	8	
8	- Regulation of gene activity in prokaryotes - Regulation of gene activity in eukaryote	4	0	8	
9	- Gene manipulation	4	0	8	
10	- Bioinformatics	4	0	8	
11	- Molecular biology is expanding	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 use basic molecular biology to understand and describe biological phenomena at all levels of biological organization and complexity especially in relation to students's research interest.
- 13.2 The ability to describe properties and relationship of biological, chemical, and physical properties of macromolecules.
- 13.3 The ability to describe overviews of important biological processes such as replication, transcription, translation and mutation.
- 13.4 The ability to relate biological phenomena at molecular level and evolutionary thinking.
- 13.5 The ability to set molecular hypothesis and thinking through the experimental facts.
- 13.6 The ability to test experimental result against hypotheses.
- 13.7 The ability to describe principles of instrument and key technologies in molecular biology

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. Assessment make from the set-forward criteria:-student who gets 85% up will

have Grade A Students must attend at least 80% of the total class hours of this course.

Midterm examination	40%
Final examination	40%
Class attendance	20%
and participation and problem sets	
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. Malacinski, G.M. Essentials of molecular biology (EMB) 4<sup>th</sup> Edition. USA. Jones and Bartlett Publishers. 2003.
2. Turner, P. C., McLennan, A.G., Bates, A. D. and White, M.R.H. Instant notes in , molecular biology. (INMB) 1<sup>st</sup> Edition. USA. BIOS Scientific Publishers. 1997.

#### **16 Instructor (s)**

Assistant Professor Sujinda Thanaphum  
Dr. Edward Grand.

#### **17. Course Coordinator**

Assistant Professor Sujinda Thanaphum  
Dr. Edward Grand.