

## Course Syllabus

MBMG 500 Essentials in Molecular Biology

Academic year 2019

**Course ID and Name:** MBBG 500 Essentials in Molecular Biology

**Course coordinator:** Assoc..Prof. Apinunt Udomkit

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### Instructors:

1. Prof. Chanan Angsuthanasombat
2. Prof. Duncan R. Smith
3. Assoc. Prof. Albert Ketterman
4. Assoc. Prof. Apinunt Udomkit
5. Assoc. Prof. Chalernporn Ongvarrasopone
6. Assoc. Prof. Kanokporn Triwitayakorn
7. Assoc. Prof. Panadda Boonserm
8. Asst. Prof. Kusol Pootanakit
9. Asst. Prof. Sarin Chimnaronk
10. Lect. Duangrudee Tanramluk
11. Lect. Gerd Katzenmeier
12. Lect. Poochit Nonejuie

**Credits:** 2 (2-0-4)

**Curriculum:** Master of Science Program in Molecular Genetics and Genetic Engineering  
(required course)

Doctor of Philosophy Program in Molecular Genetics and Genetic  
Engineering (required course for students from B.Sc.)

**Semester offering:** First semester

**Pre-requisites:** None

### Expected learning outcomes:

1. Explain the fundamental structure, properties and functions of cells and biomolecules
2. Compare and analyze molecular processes and mechanisms of regulation in prokaryotes and eukaryotes

3. Describe principles of basic techniques and bioinformatics tools necessary for molecular biology research

**Alignment of teaching and assessment methods to course learning outcome:**

Course learning outcome	Teaching method	Assessment methods
1. Explain the fundamental structure, properties and functions of cells and biomolecules	Lecture, active learning, class discussion	Written examination, in class observation, assessment of assigned work
2. Compare and analyze molecular processes and mechanisms of regulation in prokaryotes and eukaryotes	Lecture, active learning, class discussion	Written examination, in class observation, assessment of assigned work
3. Describe principles of basic techniques and bioinformatics tools necessary for molecular biology research	Lecture, active learning, class discussion	Written examination, in class observation, assessment of assigned work

**Course description:**

Overview of cell structure and function, Structure of nucleic acids, Genes and genome organization, DNA replication, Transcription, Translation, Protein structure and function, Protein trafficking, Isolation, purification and detection of nucleic acids, Basic DNA cloning, Polymerase chain reaction (PCR) and DNA sequencing, Basic protein analysis

**Course schedule:**

Date: Monday, Tuesday, Thursday

Time: 09.30-11.30 and 13.30-15.30

Room C405

Date/Time	Topic/Details	Number of Hours	Class Activity/Teaching Media	Lecturer
<b>Mon, Aug 5</b> 09.30-11.30	1 Overview of cell structure and function	2	Lecture, active learning, class discussion	Duncan
13.30-15.30	2 Structure of nucleic acids	2	Lecture, active learning, class discussion	Sarin
<b>Tue, Aug 6</b> 09.30-11.30	3 Genes and genome organization	2	Lecture, active learning, class discussion	Kanokporn
13.30-15.30	4 DNA replication	2	Lecture, active learning, class discussion	Poochit
<b>Thu, Aug 8</b> 09.00-12.00	<b>Student orientation by Faculty of Graduate Studies</b>			
13.30-15.30	5 Translation	2	Lecture, active learning, class discussion	Gerd
<b>Fri, Aug 9</b> 09.30-11.30	6 Transcription	2	Lecture, active learning, class discussion	Apinunt
<b>Tue, Aug 13</b>	<b>Examination I</b>			
<b>Fri, Aug 16</b> 09.30-11.30	7 Protein structure and function	2	Lecture, active learning, class discussion	Chanan
13.30-15.30	8 Lipids and carbohydrates	2	Lecture, active learning, class discussion	Chanan
<b>Mon, Aug 19</b> 09.30-11.30	9 Protein trafficking	2	Lecture, active learning, class discussion	Albert
13.30-15.30	10 Isolation and purification of nucleic acids	2	Lecture, active learning, class discussion	Kanokporn
<b>Thu, Aug 22</b>	<b>Examination II</b>			
<b>Mon, Aug 26</b> 09.30-11.30	11 Detection of nucleic acids	2	Lecture, active learning, class discussion	Gerd
13.30-15.30	12 Basic principles of DNA cloning	2	Lecture, active learning, class discussion	Chalernporn
<b>Tue, Aug 27</b> 09.30-11.30	13 Polymerase chain reaction (PCR) and DNA sequencing	2	Lecture, active learning, class discussion	Kusol

Date/Time	Topic/Details	Number of Hours	Class Activity/Teaching Media	Lecturer
13.30-15.30	14 Basic Bioinformatics	2	Lecture, active learning, class discussion	Duangrudee
Thu, Aug 29 13.30-15.30	15 Basic principles of protein analysis	2	Lecture, active learning, class discussion	Panadda
Mon, Sep 2	Final Examination			

**Assessment Criteria:**

Written examination/Assignment 95 %

Class Attendance 5 %

Student's achievement will be graded using symbols: A, B+, B, C+, C based on the distribution of students' scores from the whole course.

**Date revised:** 10 July 2019