Course Syllabus

MBMG 500 Essentials in Molecular Biology

Academic year 2022

Course ID and Name: MBMG 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. Chalermporn Ongvarrasopone
6. Assoc. Prof. Panadda Boonserm
7. Assoc. Prof. Sarin Chimnaronk
8. Asst. Prof. Duangrudee Tanramluk
9. Asst. Prof. Kusol Pootanakit
10. 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 structures, 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
4. Show disciplines and responsibility for assigned works
5. Use appropriate information technology to explore literatures in Molecular Biology

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	Online lecture, active learning, discussion	Written examination, class participation, assessment of assigned work
2. Compare and analyze molecular processes and mechanisms of regulation in prokaryotes and eukaryotes	Online lecture, active learning, discussion	Written examination, class participation, assessment of assigned work
3. Describe principles of basic techniques and bioinformatics tools necessary for molecular biology research	Online lecture, active learning, discussion	Written examination, class participation, 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; lipids and carbohydrates; protein trafficking; isolation, purification and detection of nucleic acids; basic DNA cloning; polymerase chain reaction (PCR) and DNA sequencing; basic bioinformatics; basic protein analysis

Course schedule:

Date: Monday, Tuesday, Thursday
Time: 09.30-11.30 and 13.30-15.30
Online Teaching (Zoom/Webex)

Date/Time	Topic/Details	Number of Hours	Class Activity/Teaching Media	Lecturer
Tue, Aug 2 09.00-09.30	Introduction to the course	30 min	Zoom	Apinunt
09.30-11.30	1 Overview of cell structure and function	2	Online lecture, active learning, class discussion	Duncan
*Wed, Aug 3 13.30-15.30	2 Genes and genome organization	2	Online lecture, active learning, class discussion	Poochit

Date/Time	Topic/Details	Number of Hours	Class Activity/Teaching Media	Lecturer
Thu, Aug 4 09.30-11.30	3 Structure of nucleic acids	2	Online lecture, active learning, class discussion	Sarin
13.30-15.30	4 DNA replication	2	Online lecture, active learning, class discussion	Poochit
Mon, Aug 8 09.30-11.30	5 Transcription	2	Online lecture, active learning, class discussion	Apinunt
13.30-15.30	6 Translation	2	Online lecture, active learning, class discussion	Chanan
Tue, Aug 9 09.30-11.30	7 Protein structure and function	2	Online lecture, active learning, class discussion	Chanan
13.30-15.30	8 Lipids and carbohydrates	2	Online lecture, active learning, class discussion	Chanan
Thursday, Aug 11 09.30-11.30	9 Protein trafficking	2	Online lecture, active learning, class discussion	Albert
13.30-15.30	10 Isolation and purification of nucleic acids	2	Online lecture, active learning, class discussion	Poochit
Mon, Aug 15	**Examination I (09.00-12.00)**			
Tue, Aug 16 09.30-11.30	11 Basic principles of DNA cloning	2	Online lecture, active learning, class discussion	Chalermporn
13.30-15.30	12 Detection of nucleic acids	2	Online lecture, active learning, class discussion	Apinunt
Thu, Aug 18 09.30-11.30	13 Polymerase chain reaction (PCR) and DNA sequencing	2	Online lecture, active learning, class discussion	Kusol
13.30-15.30	14 Basic Bioinformatics	2	Online lecture, active learning, class discussion	Duangrudee
Mon, Aug 22 09.30-11.30	15 Basic principles of protein analysis	2	Online lecture, active learning, class discussion	Panadda
Thu, Aug 25	**Final Examination (09.00-12.00)**			

*** Lecture 2 will be on Wednesday**

Assessment Criteria:

Written examination/Assignments 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: *23 June 2022*