

ICBI 308 Molecular Biology

General Information

1. Course code and course title

Thai ชีววิทยาระดับโมเลกุล

English ICBI 308 Molecular biology

2. Number of credits 4 (4-0-8)

3. Program and type of subject

3.1 Program Undergraduate Degree (International Program)

3.2 Type of Subject Required

4. Course Coordinator and Course Lecturer

4.1 Course Coordinator Patsarin Wongkamhang

4.2 Course Lecturer Patsarin Wongkamhang

5. Trimester/ Year of Study

5.1 Trimester 2 / Year 3 & Year 4

5.2 Course Capacity Approximately 30 students

6. Pre-requisite ICBI 101 Biology

7. Co-requisites N/A

8. Venue of Study Mahidol University International College

9. Date of Latest Revision

Date 11 Month December Year 2018

Goals and Objectives

1. Course Goals

Upon successful completion of this course, students should be able to **apply** knowledge and basic techniques in Molecular biology to solve issues related to health and environmental problems

2. Objectives of Course Development/Revision

2.1 Course Objectives

1. Provides knowledge of biological processes at the molecular level, focusing on the Central Dogma: Processes and regulations of Transcription, mRNA modifications and Translation
2. Provides molecular techniques and tools used to study genes and proteins.
3. Exercise students critical thinking through problem-based learning using issues related to Health and/or environment
4. Exercise students' intellectual curiosity, independent learning and teamwork through project-based learning

2.2 Course-level Learning Outcomes: CLOs

By the end of the course, students will be able to (CLOs)

CLO1 Possess knowledge in Molecular biology (1.1)

CLO2 Apply knowledge in Molecular biology (1.4)

CLO3 Draw meaningful conclusion from the scientific data/materials (2.2)

CLO4 Retrieve relevant scientific information independently (2.3)

CLO5 Demonstrate proficiency in oral communication (3.1)

CLO6 Demonstrate accountability, responsibility and team-working skill (4.2)

CLO7 Able to set, plan and accomplish assigned project in timely manner (4.5)

1. Teaching plan

Date	Topic	Teaching Activities
10/9/19	Why Molecular biology?	lecture and discussion
12/9/19	DNA Cloning I	lecture
17/9/19	DNA Cloning II	lecture
19/9/19	Cloning exercise and presentation	group discussion and presentation
24/9/19	Molecular tools I	lecture
26/9/19	Molecular tools II	lecture
1/10/19	Molecular tools exercise I	group discussion and presentation
3/10/19	Molecular tools exercise II	group discussion and presentation
8/10/19	Prepare for exam	
10/10/19	Midterm Exam	
15/10/19	Bacteria transcription I	lecture
17/10/19	Bacteria transcription II	lecture
22/10/19	Bacteria transcription exercise	group discussion and presentation
24/10/19	prepare for project proposal	
29/10/19	Project proposal	presentation
31/10/19	Eukaryotic transcription	lecture
5/11/19	Eukaryotic transcription	lecture
7/11/19	Eukaryotic transcription	lecture
12/11/19	Eukaryotic transcription	lecture
14/11/19	Eukaryotic translation	lecture
19/11/19	Eukaryotic translation	lecture
21/11/19	"Eukaryotic transcription/translation" exercise	group discussion and presentation
26/11/19	Project presentation	presentation
28/11/19	Project presentation	presentation

2. Plan for Assessing Course Learning Outcomes

2.1 Assessing and Evaluating Learning Achievement

a. Formative Assessment (this is an internal assessment)

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)
CLO1 Possess knowledge in Molecular biology CLO2 Apply knowledge in Molecular biology CLO3 Draw meaningful conclusion from the scientific data/materials	exercises (5% x4)	20
CLO4 Retrieve relevant scientific information independently CLO6 Demonstrate accountability and responsibility and team-working skills	project proposal	5
CLO2 Apply knowledge in Molecular biology CLO3 Draw meaningful conclusion from the scientific data/materials CLO4 Retrieve relevant scientific information independently CLO5 Demonstrate proficiency in oral communication CLO7 Able to set, plan and accomplish assigned project in timely manner	Project presentation	20
CLO6 Demonstrate accountability and responsibility and team-working skills	Peer review	5
Total		50

b. Summative Assessment

(1) Tools and Percentage Weight in Assessment and Evaluation

Learning Outcomes	Assessment Methods	Assessment Ratio (Percentage)
CLO1 Possess knowledge in Molecular biology CLO2 Apply knowledge in Molecular biology CLO3 Draw meaningful conclusion from the scientific data/materials	Midterm examination Final examination	25 25
Total		50

Teaching Materials and Resources

1. Textbooks and/or other documents/materials

Robert W. Weaver. Molecular Biology 4th Edition. USA

2. Recommended textbooks and/or other documents/materials

Sharma et al. 2010. Transcriptional switching in *Escherichia coli* during stress and starvation by modulation of sigma 70 activity. FEMS Microbiol. Rev. 34:646.

Ariel et al. 2003. Genome-based bioinformatic selection of chromosomal *Bacillus anthracis* putative vaccine candidate coupled with proteomic identification of surface-associated antigens. Infection and Immunity 71:4563.

3. Other Resources (If any)