



Course Syllabus (Academic Year 2020)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KACB 309 Basic Cellular and Molecular Biology Laboratory
Credit (study hours) : 1 (0-3-1)
2. **Program Name** : Bachelor of Science in Conservation Biology
3. **Course Module** : Conservation Biology Core Course
Pre/co-requisite : KACB209
4. **Class Semester** : 1st Semester 2nd Semester Academic Year 2020
5. **Class Schedule & Venue** : Tuesday, 13:00 – 16:00 PM, Room XXXX, Laboratory Building
6. **Class Coordinator** : Lect. Supatra Chunchob
 Contact No. : 085-0989419 E-mail: supatra.chn@mahidol.edu

7. Course Description

Laboratory techniques in Molecular and cellular biology, science materials and the laboratory equipment, chemical preparation, specimen preparation for the light microscope, molecular cloning, restriction endonuclease, agarose gel electrophoresis, the DNA ligation, bacteria transformation, the selection of recombinant clones, the polymerase chain reaction (PCR), the DNA extraction, an application for conservation biology and biodiversity

8. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	To describe the concept of Biosafety and ethics in Molecular biology				
8.2	To practice to work with general laboratory equipment				
8.3	To do the laboratory practices in molecular biology such as DNA extraction gene cloning genetic engineering and genome analysis				
8.4	To identify the application of suitable molecular techniques for conservation biology				

NOTE: *PLOs = Program Learning Outcomes

9. Class Instructor List

Name	Contact no.	Email
9.1 Supatra Chunchob (SC)	085-0989419	supatra.chu@mahidol.edu
9.2 Chetsada Phaenark (CP)	080-0762169	chetsada.pha@mahidol.edu
9.3 Weerachon Sawangproh (WS)	093-3390526	weerachan.saw@mahidol.edu

10. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names	Lab Preparation
1	19 Jan 21	Biosafety and ethics in Molecular biology General laboratory equipment	1, 2	- Lab Test - Discussion	<u>Supatra</u> Chetsada Weerachon	Thanaphat
2	26 Jan 21	Study of cell structure using light microscope	1-3	- Lab practice - Quiz	<u>Chetsada</u> Supatra Weerachon	Thanaphat
3	2 Feb 21	Cell Staining Techniques	1-3	- Lab practice - Quiz	<u>Chetsada</u> Supatra Weerachon	Thanaphat
4	9 Feb 21	Sample collection and stock solution preparation	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
5	16 Feb 21	Animal Genomic DNA extraction	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
6	23 Feb 21	Plant Genomic DNA extraction	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
7	2 Mar 21	Plasmid DNA extraction	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
8	9 Mar 21	Restriction enzyme analysis and Agarose gel electrophoresis	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
9	Mid-term Examination (15 – 19 Mar 2021)					
10	23 Mar 21	Polymerase Chain Reaction (PCR)	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names	Lab Preparation
11	30 Mar 21	Recombinant plasmid DNA construction and Bacteria cell transformation	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
12	*6 Apr 21	Selection of recombinant bacteria cell	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
13	*13 Apr 21	Protein extraction and Protein analysis by SDS-PAGE	1-3	- Lab practice - Quiz	<u>Supatra</u> Chetsada Weerachon	Thanaphat
14	20 Apr 21	Bioinformatics Tools for Data Analysis	3,4	- Lab practice - Quiz	<u>Weerachon</u> Supatra Chetsada	Thanaphat
15	27 Apr 21	DNA sequence analysis and phylogenetic tree construction	3, 4	- Lab practice - Quiz	<u>Weerachon</u> Supatra Chetsada	Thanaphat
16	4 May 21	Lab discussion and Conclusion	1-4	Group discussion	All Instructors	Thanaphat
17	Final Examination (3 – 14 May 2021)					
18						

* Makeup Class

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam (Laboratory)	3 hour practical exam (other regulations will be announced in the class later)	1-3	1-8	25
11.2	Final exam (Laboratory)	3 hour practical exam (other regulations will be announced in the class later)	1-4	1-8, 10-17	25
11.3	Quiz	Every week	1-4	1-8, 10-17	15
11.4	Lab Reports	Every week	1-4	1-8, 10-17	30
11.5	Class participation	On time class	1-4	1-8, 10-17	5
				Total	100

12. Grading System

Criterion-referenced evaluation

Grade	Score	Grade	Score	Grade	Score	Grade	Score
A	$\geq 80\%$	B	70 – 74.99%	C	60 – 64.99%	D	50 – 54.99%
B+	75 – 79.99%	C+	65 – 69.99%	D+	55 – 59.99%	F	< 50 %

Norm-referenced evaluation

*If use both criterion and norm-referenced evaluation, please tick two boxes.

13. References

13.1 Alberts Bray et al., 2010. Essential Cell Biology. 3th edition. Garland Science

13.2 Cooper, G.M. and Hausman, R.F. 2007. The Cell: A Molecular Approach. 4th edition. Sinauer Associates, Inc Sunderland, Massachusetts.