

Course Syllabus
MBSB 502 Applied Systems Biosciences
Academic Year 2023

Course ID and name: MBSB 502 Applied Systems Biosciences
Course coordinator: Dr. Duangnapa Kovanich
Email: duangnapa.kov@mahidol.ac.th
Asst. Prof. Alita Kongchanagul
Email: Alita.kon@mahidol.ac.th

Instructors:

1. Assoc. Prof. Panat Anuracpreeda
2. Assoc. Prof. Patompon Wongtrakoongate
3. Assoc. Prof. Soraya Chaturongakul
4. Asst. Prof. Narisorn Kitiyanant
5. Asst. Prof. Alisa Tubsuwan
6. Asst. Prof. Natee Jearawiriyapaisarn
7. Asst. Prof. Phatchariya Phannasil
8. Asst. Prof. Poochit Nonejuie
9. Asst. Prof. Alita Kongchanagul
10. Dr. Kittiphong Paiboonsukwong
11. Dr. Promsin Masrinoul
12. Dr. Duangnapa Kovanich
13. Dr. Chutima Thepparit

Credits: 3 (3-0-6)
Curriculum: Doctor of Philosophy Program in Systems Biosciences (Required course)
Semester offering: First semester
Prerequisite: None
Course level: Advanced

Course Description:

Stem cells and organogenesis, Omics studies in Thalassemia, cancer and cancer immunotherapy, microbiome, host-pathogen interactions, immune system and responses to infection, current topics on immune response to infection, vaccine strategies, innovation in vaccine research, Omics studies in cell signalling research, and Omics-based biomarkers.

Course Learning Outcomes (CLOs)

Upon completion of this course, students are able to:

1. Explain content knowledge and core principles in systems biosciences
2. Obtain critical information from systems-biosciences experimental examples since the level of molecules to cells, tissues, and organs

3. Apply the obtained knowledge with integration of genomics, transcriptomics, proteomics, and metabolomics to construct analytical framework for systems-biosciences research

Constructive Alignment of Course Content to CLOs and Program ELOs

Lecture No.	Topic	CLOs	Program ELOs
1	Overview (recap)	1,2	1-2
2	Stem cells I	1,2	1-2
3	Stem cells II	1,2	1-2
4	Research highlight in the topic of stem cells	1-3	1-8
5	Thalassemia I	1,2	1-2
6	Thalassemia II	1-3	1-3
7	Thalassemia III	1,2	1-2
8	Research highlight in the topic of Thalassemia	1-3	1-8
9	Cancer	1,2	1-2
10	Cancer immunotherapy	1,2	1-2
11	Microbiome I	1,2	1-3
12	Microbiome II	1,2	1-3
13	Parasite research	1,2	1-3
14	Immune I	1,2	1-2
15	Immune II	1,2	1-2
16	General vaccinology	1,2	1-2
17	Innovation in vaccine research	1,2	1-2
18	Research highlight Topic: Vaccines	1-3	1-8
19	Cell signaling	1,2	1-2
20	Translational research	1,2	1-2
21	Biomarker	1,2	1-2

Course Schedule 2022

Tuesday, Wednesday, and Friday, Time 10:00-12:00, Room A409

Date	Lecture No.	Topic	Teaching & Learning Strategy	Assessment	Instructor
7/2/2023	1	Overview (recap)	Interactive lecture	Class discussion	Narisorn
8/2/2023	2	Stem cells I	Interactive lecture	Class discussion, Performance assessment using rubrics	Narisorn
10/2/2023	3	Stem cells II	Interactive lecture	Class discussion, Performance assessment using rubrics	Alisa
15/2/2023	4	Research highlight in the topic of stem cells	Presentation, group discussion	Performance assessment using rubrics, Q&A	All staffs
17/2/2023	5	Thalassemia I	Interactive lecture	Class discussion, Performance assessment using rubrics	Kittiphong
21/2/2023	6	Thalassemia II	Interactive lecture, group discussion	Class discussion, Performance assessment using rubrics	Natee
22/2/2023	7	Thalassemia III	Interactive lecture	Class discussion, Performance assessment using rubrics	Kittiphong Natee
28/2/2023	8	Research highlight in the topic of Thalassemia	Presentation, group discussion	Performance assessment using rubrics, Q&A	All staffs
1/3/2023	9	Cancer	Interactive lecture	Assignment	Phatchariya
3/3/2023	10	Cancer immunotherapy	Interactive lecture	Class discussion, Performance assessment using rubrics	Patompon
7/3/2023	11	Microbiome I	Interactive lecture	Assignment	Poochit
8/3/2023	12	Microbiome II	Interactive lecture	Class discussion,	Soraya

				Performance assessment using rubrics	
10/3/2023	13	Parasite research	Interactive lecture	Class discussion, Performance assessment using rubrics	Panat
14/3/2023	14	Immune I	Interactive lecture	Class discussion, Performance assessment using rubrics	Alita
15/3/2023	15	Immune II	Interactive lecture	Class discussion, Performance assessment using rubrics	Alita
17/3/2023	16	General vaccinology	Interactive lecture	Class discussion, Performance assessment using rubrics	Promsin
21/3/2023	17	Innovation in vaccine research	Interactive lecture	Class discussion, Performance assessment using rubrics	Promsin
28/3/2023	18	Research highlight Topic: Vaccines	Presentation, group discussion	Performance assessment using rubrics, Q&A	All staffs
30/3/2023	19	Cell signaling	Interactive lecture	Assignment	Duangnapa
4/4/2023	20	Translational research	Interactive lecture	Class discussion, Performance assessment using rubrics	Kittiphong
5/4/2023	21	Biomarker	Interactive lecture	Class discussion, Performance assessment using rubrics	Chutima

Assignments

1. Reading, practical or problem-solving assignments from instructors
2. Paper discussions

Assessment Criteria

Assessment Criteria	Assessment Method	Scoring Rubric
Assignment/Exam (15%)	1) Take-home assignments	1) Punctual assignment submission 2) Creativity 3) Sequencing of information 4) Content accuracy 5) Supporting evidences 6) Grammar and originality
Class discussion (45%)	1) Direct observation 2) Class activities and discussion	1) Level of engagement 2) Class participation and cooperative attitude during class
Attendance/participation (10%)	1) Direct observation 2) Group activities and discussion	1) Attendance and punctuality 2) Participation 3) Distracting behaviors 4) General attitude towards learning
Presentation (30%)	1) Presentations 2) Group discussion	1) Organization 2) Content 3) Subject knowledge/ answering questions 4) Presentation style

Students must receive a score of 60% or more to pass the course. Student's achievement will be graded using symbols: A, B+, B, C+, C and F based on the following criteria;

Percentage	Grade	Description
≥ 80%	A	Excellent
75-79.99%	B ⁺	Good
70-74.99%	B	Fairly good
65-69.99%	C ⁺	Fair
60-64.99%	C	Poor
< 60%	F	Fail

However, a final grade will be adjusted based on frequency distribution of student's scores from the whole course.

Appeal Procedure

Should the students have any appeal regarding the assessments or grade, inquiry can be made to the instructors and/or the course coordinator immediately either by direct contact, telephone or email.

Course Reading Materials

A series of textbooks, online resources and appropriate journal articles will be introduced throughout the course by the instructors. These materials may be found on the google classroom.

General Inquiry

Ms. Siriporn Monkasemsiri siriporn.mon@mahidol.edu; Tel. 02-441-9003-7 ext. 1314

Date revised: February 19, 2023

MBSB502 Rubric for classroom discussion

Rubric Criteria	Weight	Unsatisfactory	Minimal	Effective	Exemplary
Level of Engagement	90%	Fails to contribute to class activities . Fails to invite comment/opinions from other students. Demonstrates little understanding of main points, Does not identify or summarize main points	Occasionally contributes to class activities by offering ideas and asking questions . Sometimes engages others in class discussions. Sometimes has an understanding of main points. Identifies and summarizes some of the main points.	Contributes to class activities by offering ideas and asking questions on a regular basis. Often engages others in class discussions by inviting their comments. Challenges the accuracy and relevance of statements made. Identifies and summarizes main points.	Contributes to class activities by offering quality ideas and asking appropriate questions on a regular basis. Actively engages others in class discussions by inviting their comments. Constructively challenges the accuracy and relevance of statements made.
Attitude	10%	Rarely if ever participates in classroom projects and discussions. Occasional disruptive behavior.	Seldom actively participates in classroom projects and discussions. Sometimes supportive of other students' ideas	Usually positive and cooperative with classroom projects and discussions. Often supportive of other students' ideas.	Consistently positive, cooperative attitude during class. Always supportive of other students' ideas .

Instructure name: