

**COURSE SYLLABUS**  
**MBMB 650 Technological Innovative Learning**  
**Academic Year 2025**

**Course ID and Title: MBMB 650 Technological Innovative Learning**

**Course Coordinator:**

Name: Narisra Komalawardhana (Ph.D. in Science and Technology Education)

Office: Institute for Molecular Biosciences  
Room B302 (3<sup>rd</sup> floor, wing-B)

Contact: Mobile 0 94 663 2244  
Email: narisra.kom@mahidol.edu  
Office Hours: by appointment

**Instructor:**

1. Narisra Komalawardhana, Ph.D.  
**Email:** narisra.kom@mahidol.edu  
**Office Hours:** by appointment



**Support Staff:**

1. Xxx xxxx  
**Email:** xxx

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

**Curriculum:** Master of Science Program in Molecular and Integrative Biosciences (Elective Course)  
Doctor of Philosophy Program in Molecular and Integrative Biosciences (Elective Course)

**Semester:** X<sup>xx</sup> Semester

**Pre-Requisites:** None

**Course learning outcomes**

At the end of this course, students will be able to:

1. Follow the rules and regulations of the course by submitting work and attending class and don't copy other people's work.
2. Search, analyze and apply knowledge of technological innovative learning in bioscience education and justify their use for learning process.
3. Design technological innovation integrated with specific bioscience content for enhancing learning.
4. Deliver creative/inventive idea(s) about the use of technological innovative learning in bioscience education.
5. Communicate knowledge of the use of technological innovative learning to a variety of audiences together with professional and interpersonal skills.

**Alignment of Teaching and Assessment Methods to Course Learning Outcomes:**

<b>Course Learning Outcomes (CLOs)</b>	<b>Teachning Method</b>	<b>Assessment Method</b>
1. Follow the rules and regulations of the course by submitting work and attending class and don't copy other people's work.	1. Interactive Lecture, Discussion	1. Class participation
2. Search, analyze and apply knowledge of technological innovative learning in bioscience education and justify their use for learning process.	1. Interactive Lecture, Discussion 2. Experiential-based learning 3. Hands-on practice	1. Class participation 2. Quiz / short exercise 3. AssignmentI
3. Design technological innovation integrated with specific bioscience content for enhancing learning.	1. Interactive Lecture, Discussion 2. Experiential-based learning 3. Hands-on practice	1. Class participation 2. Quiz / short exercise 3. Assignment II
4. Deliver creative/inventive idea(s) about the use of technological innovative learning in bioscience education.	1. Interactive Lecture, Discussion 2. Experiential-based learning 3. Presentation	1. Class participation 2. Assignment I,II 3. Communication
5. Communicate knowledge of the use of technological innovative learning to a variety of audiences together with professional and interpersonal skills.	Presentation, Discussion	1. Communication

**Course description:**

Principle, concept, design and application of technological innovative learning to improve bioscience education process; role of technology in the learning process; online teaching and learning strategies; technology for measurement and evaluation in bioscience education; learning management system in the technological innovative education. Relationship between technology and educational reform; relationship between technology, specific content, and pedagogy;

**Class period and venue**

Date and time: Monday- Wednesday at 9:00 a.m. – 4:00 p.m. and Thursday at 9:00 a.m. – 12:00 p.m.

Place: Hybrid-learning:

- Online class by Webex and Google Classroom or other platforms where Webex is not possible
- Onsite class at Room xxx

Online link: To be announced (*Online learning is also available in any circumstances where face-to-face meetings are not possible*)

**Course schedule**

	<b>Activities</b>	<b>Description</b>	<b>Time</b>	<b>Instructor</b>
<b>Monday, xxx xx, 20xx</b>				
1	Lecture and Discussion overview and background	<ul style="list-style-type: none"> <li>- To go over and discuss                             <ul style="list-style-type: none"> <li>- the course Introduction</li> <li>- Principal and concept of Technological Innovative education</li> <li>- Design and application of innovation education (role of technology in the learning process)</li> </ul> </li> </ul>	9:00- 11:00 am	NK
		<ul style="list-style-type: none"> <li>- Technology for measurement and evaluation in bioscience education</li> <li>- Learning management system in the technological innovative education</li> <li>- Relationship between technology and educational reform; relationship between technology, specific content, and pedagogy;</li> </ul>	11:00am – 12:00 pm	NK
2	Lecture/ Discussion and Computer Lab:	- To search for related research work involving technological innovative learning in bioscience education	1:00 - 2:00 pm	NK
3	Discussion	<ul style="list-style-type: none"> <li>- To discuss and go over the result of searching and show the use of the technological innovative learning.</li> <li>- To assign the assignment. (to select the related research work)</li> </ul>	2:00 – 4:00 pm	NK
<b>Tuesday, xxx xx, 20xx</b>				
1	Lecture/ Lab/ Discussion	- To discuss the examples of the Use of the technological innovative learning and assignment (Functions and Features, Role of Technology, Technology for measurement and evaluation in education)	9:00 am – 12:00 pm	NK
2	Presentation/ Discussion	- To present and discuss about the use of the technological innovative learning and assignment (Functions and Features, Role of Technology, Technology for measurement and evaluation in education).	1:00 – 3:00 pm	NK
		- To assign the assignment. (to design technological innovation integrated with specific bioscience content for enhancing learning)	3:00 – 4:00 pm	NK
<b>Wednesday, xxx xx, 20xx</b>				
1	Lab / Discussion	- To design and discuss technological innovation integrated with specific bioscience content for enhancing learning	9:00 am – 12:00 pm	NK
2	Presentation/ Discussion	- To present and discuss about the design of the technological innovative learning and assignment (Functions and Features, Role of Technology, Technology for measurement and evaluation in education).	1:00 – 4:00 pm	NK
<b>Thursday, xxx xx, 20xx</b>				
1	Student’s Reflect	- To provide students opportunities to describe their learning experiences received from this course and how it can be applied to their future learning.	9:00 am – 12:00 pm	NK

	Activities	Description	Time	Instructor
2	After Action review	- To collect comments, suggestions from students for further improvements of the course.		

**Assessment Criteria:**

No	Assessment Criteria	Description (In details)	Scoring Rubric			
			1	2	3	4
1	Class Participation (10%)	Attendance and punctuality (2%)	Attend class late or leave early ( $\geq 15$ min.)	Attend class late or leave early (not more than 15 min.)	Attend class on time	Attend class early
		Active Contribution (4%)	Never contributes to class	Seldomly contributes to class	Occasionally contributes to class	Proactively and regularly contribute to the class
		Active Listening (4%)	Lack of attention to the discussed topic	Listen when others discuss and occasionally respond to the discussed topic	Listen when others discuss and sometimes respond to the discussed topic	Appropriately listen when others discuss and consistently respond to the discussed topic
2	Quiz / Exercise (10%)	Depending on the correctness and completion (10%)	Raw scores will be adjusted to be in a range of 0-10%			
3	Assignment I (30%)  to analyze articles that discuss enhancing learning through various technologies, with one article assigned. Subsequently, the students are expected to engage in presentation and discussions about the ways each technology can enhance learning in the classroom.	Punctuality (Submit) (5%)	Not submit	Very Late	Late	On-time
		Searching Quality (5%)	The selected research article is up-to-date but has a low quality, ranked in Q4	The selected research article is up-to-date, and has a moderate quality, ranked in Q3	The selected research article is up-to-date, and has a high quality, ranked in Q2	The selected research article is up-to-date, and has a very high quality, ranked in Q1
		Analysis Quality (20%)  Able to state - What are the topic/ key concept of the subject matter/ learning objectives taught in the lesson ?  - What are the learning tasks/activities in the lesson?	The analysis lacks meaningful examination of technology integration in the selected content. It offers superficial or vague discussions of strengths, limitations, and impact on teaching and learning	The analysis adequately covers the integration of technology in the selected content, though some aspects of its strengths, limitations, or impact on teaching and learning may lack depth or clarity	The analysis effectively explores the integration of technology in the selected content. It discusses its strengths and limitations, addressing its impact on teaching and learning with clarity	The analysis thoroughly examines the integration of technology in the selected content. It discusses its strengths and limitations in a well-rounded manner, considering its significant impact on both

No	Assessment Criteria	Description (In details)	Scoring Rubric			
			1	2	3	4
		<ul style="list-style-type: none"> <li>- What are the technology tool(s) and key features used for the lesson?</li> <li>- How the technology tools could enhance the learning?</li> <li>- Able to explain idea for applying the technology mixed with learning strategy for your own future work.</li> </ul>				teaching and learning.
4	AssignmentII (30%)	Punctuality (Submit) (5%)	Not submit	Very Late	Late	On-time
	To elaborate on the features, functions, and effective technology learning of creative/inventive idea. Create a storyboard/report to share their idea/prototype with the class. Subsequently, the students are expected to engage in presentation and discussions about the ways each technological innovation can enhance learning of a certain topic in the classroom.	Searching Quality (5%)	The selected research article is up-to-date but has a low quality, ranked in Q4	The selected research article is up-to-date, and has a moderate quality, ranked in Q3	The selected research article is up-to-date, and has a high quality, ranked in Q2	The selected research article is up-to-date, and has a very high quality, ranked in Q1
		Analysis Quality (20%)  Able to state <ul style="list-style-type: none"> <li>- What are the topic/ key concept of the innovation?</li> <li>- What are the learning objectives taught in the lesson ?</li> <li>- What are the learning tasks/activities in the lesson?</li> <li>- What are the technology tool(s) and key features used for the lesson?</li> <li>- How the technology tools could enhance the learning? (strengths and limitations, addressing its impact)</li> </ul>	The analysis lacks meaningful examination of technology integration in the content. It offers superficial or vague discussions of strengths, limitations, and impact on teaching and learning	The analysis adequately covers the integration of technology in the content, though some aspects of its strengths, limitations, or impact on teaching and learning may lack depth or clarity	The analysis effectively explores the integration of technology in the content. It discusses its strengths and limitations, addressing its impact on teaching and learning with clarity	The analysis thoroughly examines the integration of technology in the content. It discusses its strengths and limitations in a well-rounded manner, considering its significant impact on both teaching and learning.

No	Assessment Criteria	Description (In details)	Scoring Rubric			
			1	2	3	4
4	Communication (20%)	Communicate knowledge of the use of technological innovative learning to a variety of audiences together with professional and interpersonal skills. (20%)	The student struggles to communicate knowledge of technological innovative learning to different audiences, showing a significant inability to adapt their communication to the needs and understanding of various groups of different groups	The student adequately communicates knowledge of technological innovative learning to different audiences, addressing their general needs but with potential for improvement in terms	The student effectively communicates knowledge of technological innovative learning to various audiences, adapting their approach to suit the understanding and interests of different groups	The student demonstrates exceptional ability in communicating knowledge of technological innovative learning to diverse audiences. The communication is clear, engaging, and tailored to the specific needs and backgrounds

Student's achievement will be graded using symbols: A, B+, B, C+, C, D+, D and F, based on the criteria as follows:

Percentage	Grade	Description
80–100	A	Excellent
75–79	B+	Very Good
70–74	B	Good
65–69	C+	Fairly Good
60–64	C	Fair
55–59	D+	Poor
50–54	D	Very Poor
0–49	F	Fail