

**Course Syllabus**  
**MBMB 503 Integrative Biosciences**  
**Academic year 2025**

<b>Course ID and Title</b>	MBMB 503 Integrative Biosciences ชมชม ๕๐๓ ซีวีวิทยาศาสตร์เชิงบูรณาการ
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**Credits:** 1 (1-0-2)

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

**Semester offering:** First semester

**Pre-requisites:** None

**Course learning outcomes (CLOs):**

**By the end of the course, students should be able to:**

1. assess various technologies to determine their suitability for addressing challenges and opportunities (**Knowledge**);
2. integrate concepts and ideas in molecular biosciences to create innovative products and technological innovation (**Skills**);
3. demonstrate scientific integrity, and responsibility (**Ethics**);
4. communicate new technologies or products to different audiences (**Characters**).

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

Course Learning Outcomes	Teaching Method	Assessment Method
1. Assess various technologies to determine their suitability for addressing challenges and opportunities ( <b>Knowledge</b> )	1. Problem-based learning 2. Group discussion	1. Class participation 2. Discussion performance 3. Assignment
2. Integrate concepts and ideas in molecular biosciences to create innovative products and technological innovation ( <b>Skills</b> )	1. Problem-based learning 2. Group discussion	1. Performance in problem-based learning class 2. Discussion performance
3. Demonstrate integrity and responsibility ( <b>Ethics</b> )	1. Problem-based learning 2. Group discussion	1. Presentation performance 2. Discussion performance
4. Communicate new technologies or products to different audiences (Characters).	1. Scientific presentation 2. Business pitch	

**Course description:**

Inspiration talk on integrative and innovative biosciences; innovation and design thinking process; cutting-edge biotechnology; identification and defining of problems; idea generation and evaluation; development of new products and technological innovation; scientific presentation; business pitch

การพูดคุยสร้างแรงบันดาลใจในเรื่องชีววิทยาศาสตร์เชิงบูรณาการและนวัตกรรม นวัตกรรมและกระบวนการคิดเชิงออกแบบ เทคโนโลยีชีวภาพที่ล้ำสมัย การระบุและกำหนดปัญหา การพัฒนาผลิตภัณฑ์ใหม่และนวัตกรรมทางเทคโนโลยี การนำเสนอทางวิทยาศาสตร์ การเสนอขายทางธุรกิจ

### Course Schedule (Tentative):

(Classroom XXX)

	Activities	Description	Time	Instructors and Assistants
Day 1				
1	Inspiration talk: integrative and innovative biosciences	This class aims to inspire students on how to tackle innovation challenges from scientist-inventors.	9.00 – 10.00	Invited speakers
Day 2				
1	Lecture/Discussion: Innovation and design thinking process	The process of innovation and design thinking will be introduced and discussed.	9.00 – 10.00	TBA
2	Lecture/Discussion: Cutting-edge biotechnology	Cutting-edge technologies related to the problem-based learning will be introduced and discussed.	10.00 – 11.00	TBA
Day 3				
1	Problem-based learning: identification and defining of problems	To define problems and needs for innovative thinking.	9.00 – 12.00	All
Day 4				
1	Problem-based learning: Brainstorming, idea generation and evaluation	To generate ideas and evaluate them against problems and needs.	9.00 – 12.00	All
Day 5				

1	Problem-based learning: Development of new products and technological innovation	To develop, assess, and strengthen new products and technological innovation.	9.00 – 12.00	All
Day 6				
1	Scientific presentation and discussion	To present new products to the scientific community	9.00 – 11.00	All
Day 7				
1	Business pitch	To present new products to specialist and non-specialist audiences including investors.	9.00 – 10.00	All and investors
2	Reflection and after-action review	<ul style="list-style-type: none"> <li>- To provide students opportunities to describe their learning experiences received from this course and how they can be applied to their future learning.</li> <li>- To collect comments, and suggestions from students for further improvements of the course.</li> </ul>	10.00 – 11.00	All

TBA: To Be Announced

**Assessment Criteria:**

Assessment method		Performance criteria	Scoring rubric
1	Class attendance & participation (10%)	Attendance and punctuality (5%)	Punctually (4) 5 minutes late (3) 10 minutes late (2) 15 minutes late (1) > 20 minutes late or absent (0)
		Participation (5%)	Frequently participates (4) Moderately participates (2-3) Seldom participates (1)



			Never participates (0)
2	Problem-based learning (50%)	Participation and performance (10%)	Active (4) Fairly active (2-3) Inactive (1)
		Professional and interpersonal skills (responsibility, teamwork, and leadership) (10%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
		Creative and high-order thinking skills (30%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
4	Scientific presentation and discussion (30%)	Organization (5%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
		Content (10%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
		Subject knowledge/Answering questions (10%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
		Presentation style (5%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
5	Business pitch (10%)	Product (science-business alignment) (5%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)
		Presentation style (2%)	Excellent (4) Above average (3)

			Average (2) Needs improvement (1)
		Question handling (3%)	Excellent (4) Above average (3) Average (2) Needs improvement (1)

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

Percentage range	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

Date of Revision: XXX 20XX