

**Course Syllabus**  
**MBMB 629 Cancer Biology and Precision Medicine**  
**Academic Year 2025**

**Course ID and Title:** MBMB 629 Cancer Biology and Precision Medicine

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**Instructor:**

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**Support Staff:**

1. XXX XXX  
Email: XXX

**Credits:** X(X-X-X)

**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 (CLOs):**

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

1. Describe the importance of cancer biology research and precision medicine
2. Apply the basic knowledge of cancer biology and precision medicine in molecular biosciences research
3. Deliver creative/inventive idea(s) about the novel therapeutic approach in cancer
4. Critically evaluate and present recently published literature in the field of cancer biology and precision medicine
5. Demonstrate professional and interpersonal skills

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

<b>Course Learning Outcomes</b>	<b>Teaching Method</b>	<b>Assessment Method</b>
1. Describe the importance of cancer biology research and precision medicine	1. Lecture 2. Discussion	1. Q&A during lecture 2. Discussion performance 3. Quiz / short exercise
2. Apply the basic knowledge of cancer biology and precision medicine in molecular biosciences research	1. Lecture 2. Paper discussion	1. Q&A during lecture 2. Discussion performance 3. Assignment
3. Deliver creative/inventive idea(s) about the novel therapeutic approach in cancer	1. Discussion 2. Individual or group assignment/presentation	1. Discussion performance 2. Presentation performance
4. Critically evaluate and present recently published literature in the field of cancer biology and precision medicine	1. Discussion (about scientific integrity, responsibility, and safety practice) 2. Assignment 3. Hands-on lab safety practice	1. Attendance (presence, absence, on-time?) 2. Task submission (on-time?) 3. Lab report writing (plagiarism?) 4. Lab performance (follow safety practice?)
5. Demonstrate professional and interpersonal skills	1. Discussion 2. Writing lab report 3. Individual or group assignment/presentation 4. Problem-based learning	1. Discussion performance (active participation?) 2. Lab report writing performance 3. Performance in the team (teamwork or leadership skills) 4. Problem-based project presentation performance (teamwork)

**Course Description:**

Introduction to cancer biology; Hallmarks of cancer; Cancer metastasis; Cancer metabolism; Molecular target for cancer therapy; Precision medicine; Techniques in cancer biology; Target identification in cancer treatment; Anti-cancer drug discovery; Applications in cancer research.

### Course Schedule:

(Classroom XXX and Lab Classroom XXX)

	Activities	Description	Time	Instructors and Assistants
<b>Monday, XXX XX, 20XX</b>				
1	<b>Interactive Lecture:</b> Overview and Background	Overview of Cancer Biology: basis for cancer cells and hallmarks of cancers	9.00-12.00	PP
<b>Tuesday, XXX XX, 20XX</b>				
	<b>Interactive Lecture:</b> Lecture and class discussion	Cancer metastasis research and interventions	9.00-12.00	PP
<b>Wednesday, XXX XX, 20XX</b>				
	<b>Interactive Lecture:</b> Lecture and class discussion	Cancer metabolism research: the basis of cancer metabolism, metabolomics and metabolic target for cancer therapy	9.00-12.00	PP
<b>Thursday, XXX XX, 20XX</b>				
	<b>Interactive Lecture:</b> Lecture and class discussion	Precision medicine: Molecular targets and cancer therapeutics in the future	9.00-12.00	PP
<b>Friday, XXX XX, 20XX</b>				
	<b>Interactive Lecture:</b> Lecture and class discussion	Techniques in cancer biology: Cell culture, cell cytotoxicity assay, wound healing assay, migration, invasion assay, and molecular techniques related to cancer research	9.00-12.00	PP
	<b>Paper discussion</b>	Precision medicine based on basic knowledge of cancer biology and Techniques in cancer biology	1:00 – 4:00 PM	PP
<b>Monday, XXX XX, 20XX</b>				
	<b>Interactive Lecture:</b> Lecture and class discussion	Target identification in cancer treatment	9.00-12.00	IM
<b>Tuesday, XXX XX, 20XX</b>				
	<b>Interactive Lecture:</b> Lecture and class discussion	Anti-cancer drug discovery	9.00-12.00	IM
<b>Wednesday, XXX XX, 20XX</b>				
	<b>Student's presentation, Question and answer</b>	Research highlights in precision medicine and drug discovery in cancer	9.00-12.00	PP/IM

<b>Student's Reflection</b>	To provide students opportunities to describe their learning experiences received from this course and how it can be applied to their future learning.	1:00 – 4:00 PM	PP/IM
<b>After Action Review</b>	To collect comments and suggestions from students for further course improvements.		

**Assessment Criteria:**

<b>Assessment Criteria</b>		<b>Description (in Details)</b>	<b>Scoring Rubric</b>
<b>1</b>	<b>Class Attendance (5%)</b>	Showing up in the class (5%)	<ul style="list-style-type: none"> <li>• Full attendance (4)</li> <li>• ~ 80% attendance (3)</li> <li>• ~ 60% attendance (2)</li> <li>• &lt; 50% attendance (1)</li> </ul>
<b>2</b>	<b>Assignment (20%)</b>	Content accuracy (5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Creativity (5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Sequencing of information (2.5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Supporting evidence (2.5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Grammar and originality (3%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		On-time submission (2%)	<ul style="list-style-type: none"> <li>• On-time (4)</li> <li>• Late (2-3)</li> <li>• Very late (1)</li> </ul>
<b>3</b>	<b>Quiz / Exercise (10%)</b>	Depending on the correctness and completion (10%)	<b>Raw scores will be adjusted to be in a range of 0-10%</b>

Assessment Criteria		Description (in Details)	Scoring Rubric
4	<b>Discussion Performance (20%)</b>	Participation and performance (5%)	<ul style="list-style-type: none"> <li>• Active (4)</li> <li>• Fairly active (2-3)</li> <li>• Inactive (1)</li> </ul>
		Professional and interpersonal skills (responsibility, teamwork, and leadership) (5%)	<ul style="list-style-type: none"> <li>• Active (4)</li> <li>• Fairly active (2-3)</li> <li>• Inactive (1)</li> </ul>
		Creative and high-order thinking skills (10%)	<ul style="list-style-type: none"> <li>• Highly expressed (4)</li> <li>• Fairly expressed (2-3)</li> <li>• Not shown (1)</li> </ul>
5	<b>Reflection (10%)</b>	Knowledge sharing (2.5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Inventive and creative thinking skills (2.5%)	<ul style="list-style-type: none"> <li>• Highly expressed (4)</li> <li>• Fairly expressed (2-3)</li> <li>• Not shown (1)</li> </ul>
		Communication skills (2.5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Professional and interpersonal skills (responsibility, teamwork, and leadership) (2.5%)	<ul style="list-style-type: none"> <li>• Active (4)</li> <li>• Fairly active (2-3)</li> <li>• Inactive (1)</li> </ul>
6	<b>Presentation (35%)</b>	Organization (5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Content (10%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Subject knowledge/answering questions (10%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Presentation technique and use of visual aids (5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>
		Time management (5%)	<ul style="list-style-type: none"> <li>• Excellent (4)</li> <li>• Good (3)</li> </ul>

Assessment Criteria	Description (in Details)	Scoring Rubric
		<ul style="list-style-type: none"> <li>• Fair (2)</li> <li>• Need to be improved (1)</li> </ul>

**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

**Date of Revision:** 23 August 2023