

MBMB 501 Molecular Biology

Course Syllabus
MBMB 501 Molecular Biology
Academic year 2025

Course ID and Title MBMB 501 Molecular Biology

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Asst. Prof. Kusol Pootanakit, Ph.D.
Asst. Prof. Natee Jearawiriyapaisarn, Ph.D.
Asst. Prof. Phatchariya Phannasil, Ph.D.
Asst. Prof. Poochit Nonejuie, Ph.D.
Chutima Thepparit, Ph.D.
Duangnapa Kovanich, Ph.D.
Ittipat Meewan, Ph.D.
Kittiphong Paiboonsukwong, M.D., Ph.D.
Siraprapa Boobphahom, Ph.D.

Credits: 2 (1-2-3)

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

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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. Integrate and apply the comprehensive knowledge of molecular biology to address scientific research questions
2. Develop practical research skills by conducting molecular biology experiments, analyzing and presenting lab findings using appropriate information and communication tools
3. Demonstrate scientific integrity, safety practice, and responsibilities for the work assignments
4. Demonstrate leadership, teamwork, research communication, and interpersonal skills

Course description

Overview of Central Dogma; DNA and RNA Structure and Function; Protein Structure and Function; DNA Replication; Transcription; Protein Translation; Gene Expression and Regulation in Prokaryotes; Gene Expression and Regulation in Eukaryotes; Molecular Basis of Mutation; Recombinant DNA Technology; Nucleic Acid-Based Technologies; Protein-Based Technologies; DNA and RNA Extraction; DNA Cloning; PCR and Agarose Gel Electrophoresis; Protein Extraction and SDS-PAGE

กระบวนการหลักในการควบคุมการทำงานของสิ่งมีชีวิต โครงสร้างและหน้าที่ของดีเอ็นเอและอาร์เอ็นเอ โครงสร้างและหน้าที่ของโปรตีน การจำลองตัวของดีเอ็นเอ การถอดรหัสพันธุกรรม การแปลรหัสพันธุกรรม การควบคุมการแสดงออกของยีนในโพรคาริโอต การควบคุมการแสดงออกของยีนในยูคาริโอต พื้นฐานระดับโมเลกุลของการกลายพันธุ์ เทคโนโลยีดีเอ็นเอรีคอมบิแนนท์ เทคโนโลยีด้านกรดนิวคลีอิก เทคโนโลยีด้านโปรตีน การสกัดดีเอ็นเอและอาร์เอ็นเอ การโคลนดีเอ็นเอ ปฏิกริยาลูกโซ่โพลีเมอเรสและอะกาโรสเจลอิเล็กโทรโฟรีซิส การสกัดโปรตีนและเอสดีเอสเพจ

Core Course “Molecular Biology” (2 credits)

Course Coordinator:
Panadda Boonserm



Molecular Biology	Week 1		Week 2		Week 3	
	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
Monday	Central Dogma (Flow of Genetic Information) (AU)	DNA/RNA Structure & Function (SC)	Gene Expression and Regulation (Prokaryotes) (SCC)	Gene Expression and Regulation (Eukaryotes) (CT)	LAB: DNA Extraction (CO, CT, AT, PP)	
Tuesday	Self Study		Self Study		LAB: DNA Cloning (CO, PN, IM)	
Wednesday	Protein Structure & Function (IM/SB)	DNA Replication (PN)	Molecular Basis of Mutation (CN)	Recombinant DNA Technology (CO)	LAB: PCR and Agarose Gel Electrophoresis (K Pootanakit, AT, CT)	
Thursday	Self Study		Self Study		LAB: Protein Extraction & SDS-PAGE (PB, DK)	
Friday	mRNA Transcription (NJ)	Protein Translation (SB)	Nucleic Acid-Based Technologies (KP)	Protein-Based Technologies (DK)	Reflections & After Action Review	

Alignment of Teaching and Assessment Methods to Course Learning Outcomes:

PLO (M.Sc./Ph.D.)	Course learning outcome (CLO)	Teaching method	Assessment method
PLO1	1. Integrate and apply the comprehensive knowledge of molecular biology to address scientific research questions	(1) In-class lecture and discussion (2) Active learning (3) Assignment (4) Problem-based learning	(1) Class participation (2) Assessment of assigned work (3) Quizzes (4) Problem-based learning presentation

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PLO2	2. Develop practical research skills by conducting molecular biology experiments, analyzing and presenting lab findings using appropriate information and communication tools	(1) Hands-on practice/VDO lab demonstration (2) Experimental data presentation and discussion	(1) Lab performance (2) Reports (3) Lab notebooks (4) Short presentation
PLO3	3. Demonstrate scientific integrity, safety practice, and responsibilities for the work assignments	(1) Lab safety guidelines (2) Group/individual assignment	(1) Direct observation (2) Lab performance (3) Assessment of responsibility for assigned work
PLO4	4. Demonstrate leadership, teamwork, research communication, and interpersonal skills	(1) Group/individual assignment (2) Group presentation	(1) Direct observation (2) Lab performance (3) Assessment of responsibility for assigned work (4) Class attendance (5) Group presentation

Percent Contribution of MBMB 501 Molecular Biology Course to MBMB PLOs

MBMB PLOs (for <i>M.Sc.</i> Level)	MBMB CLOs	Elements with % Contribution		
PLO1 (25%)	CLO1 Integrate and apply the	<input checked="" type="checkbox"/> Basic knowledge	7%	15

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MBMB PLOs (for M.Sc. Level)	MBMB CLOs	Elements with % Contribution		
Conceptualize, integrate, and apply fundamental knowledge of theory and practice in Molecular and Integrative Biosciences (Knowledge).	comprehensive knowledge of molecular biology to address scientific research questions	<input checked="" type="checkbox"/> Subject-specific knowledge	8%	
PLO2 (25%) Exercise cognitive and practical skills essential for conducting research in the field of Molecular and Integrative Biosciences (Skills).	CLO2 Develop practical research skills by conducting molecular biology experiments, analyzing and presenting lab findings using appropriate information and communication tools	<input checked="" type="checkbox"/> Literacy skills (reading, writing, speaking, and listening) (in English)	3%	15
		<input checked="" type="checkbox"/> High-order thinking skills (i.e. critical thinking, logical thinking, adaptive thinking, holistic thinking, etc.)	3%	
		<input checked="" type="checkbox"/> Research skills	3%	
		<input checked="" type="checkbox"/> Work skills (i.e., teamwork, organization, problem solving, conflict resolution, etc.)	3%	
		<input checked="" type="checkbox"/> Presentation and ICT skills	3%	
PLO3 (25%) Adhere to ethical standards and integrity in both personal and	CLO3 Demonstrate scientific integrity, safety practice, and	<input checked="" type="checkbox"/> Work ethics	3%	15
		<input checked="" type="checkbox"/> Research ethics	3%	
		<input checked="" type="checkbox"/> Chemical lab safety	3%	
		<input checked="" type="checkbox"/> Biosafety	3%	

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MBMB PLOs (for M.Sc. Level)	MBMB CLOs	Elements with % Contribution		
professional practices (Ethics).	responsibilities for the work assignments	<input checked="" type="checkbox"/> Social responsibility	3%	
PLO4 (25%) Possess academic and research communication, leadership and adaptability (Characters).	CLO4 Demonstrate leadership, teamwork, research communication, and interpersonal skills	<input checked="" type="checkbox"/> Communication	3%	15
		<input checked="" type="checkbox"/> Leadership	3%	
		<input checked="" type="checkbox"/> Adaptability	3%	
		<input checked="" type="checkbox"/> Creativity	3%	
		<input checked="" type="checkbox"/> Self-development	3%	
		Total	100%	60

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MBMB PLOs (for Ph.D. Level)	MBMB CLOs	Elements with % Contribution		
<p>PLO1 (25%) Evaluate and integrate novel ideas to synthesize complex knowledge systems within the field of Molecular and Integrative Biosciences (Knowledge).</p>	<p>CLO1 Integrate and apply the comprehensive knowledge of molecular biology to address scientific research questions</p>	<input checked="" type="checkbox"/> Basic knowledge	8%	15
<input checked="" type="checkbox"/> Advanced knowledge	7%			
<p>PLO2 (25%) Create and internationally publish high-quality research in Molecular and Integrative Biosciences (Skills).</p>	<p>CLO2 Develop practical research skills by conducting molecular biology experiments, analyzing and presenting lab findings using appropriate information and communication tools</p>	<input checked="" type="checkbox"/> Literacy skills (reading, writing, speaking, and listening) (in English)	3%	15
<input checked="" type="checkbox"/> High-order thinking skills (i.e. critical thinking, logical thinking, adaptive thinking, holistic thinking, etc.)	3%			
<input checked="" type="checkbox"/> Research skills	3%			
<input checked="" type="checkbox"/> Work skills (i.e., teamwork, organization, problem solving, conflict resolution, etc.)	3%			
<input checked="" type="checkbox"/> Presentation and ICT skills	3%			
<p>PLO3 (25%) Adhere to and advise best practices for ethics</p>	<p>CLO3 Demonstrate scientific integrity, safety practice, and</p>	<input checked="" type="checkbox"/> Work ethics	3%	15
<input checked="" type="checkbox"/> Research ethics	3%			
<input checked="" type="checkbox"/> Chemical lab safety	3%			

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MBMB PLOs (for Ph.D. Level)	MBMB CLOs	Elements with % Contribution		
and integrity in both personal and professional practices (Ethics).	responsibilities for the work assignments	<input checked="" type="checkbox"/> Biosafety	3%	
		<input checked="" type="checkbox"/> Social responsibility	3%	
PLO4 (25%) Possess academic and research communication, leadership and adaptability in diverse, interdisciplinary, and international environments (Characters).	CLO4 Demonstrate leadership, teamwork, research communication, and interpersonal skills	<input checked="" type="checkbox"/> Communication	3%	15
		<input checked="" type="checkbox"/> Leadership	3%	
		<input checked="" type="checkbox"/> Adaptability	3%	
		<input checked="" type="checkbox"/> Creativity	3%	
		<input checked="" type="checkbox"/> Self-sustainability	3%	
		Total	100%	60

Course schedule:

Date: Monday-Friday

Time: 09.00 AM-4.00 PM

Rooms C405 (On-site lecture) and D401 (On-site lab), Institute of Molecular Biosciences

or Webex/Zoom meetings for Online activities

Topic/Details	Time	Class Activity	Lecturer
Sep 1, 2025			
Course Orientation	9.00-9.10 AM	Introduction	Panadda
Overview: Central Dogma (Flow of Genetic Information)	9.10 – 11:30 AM	Lecture	Apinunt
DNA/RNA Structure & Function	1.30-4.00 PM	Lecture	Sarin

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Topic/Details	Time	Class Activity	Lecturer
Sep 2, 2025			
Self-study			
Sep 3, 2025			
Protein Structure & Function	9.00 – 11:30 AM	Lecture	Ittipat (Siraprapa)
DNA Replication	1.30-4.00 PM	Lecture	Poochit
Sep 4, 2025			
Self-study			
Sep 5, 2025			
mRNA Transcription	9.00 – 11:30 AM	Lecture	Natee
Protein Translation	1.30-4.00 PM	Lecture	Siraprapa
Sep 8, 2025			
Gene Expression and Regulation (Prokaryotes)	9.00 – 11:30 AM	Lecture	Soraya
Gene Expression and Regulation (Eukaryotes)	1.30-4.00 PM	Lecture	Chutima
Sep 9, 2025			
Self-study			
Sep 10, 2025			
Molecular Basis of Mutation	9.00 – 11:30 AM	Lecture	Chalongrat
Recombinant DNA Technology	1.30-4.00 PM	Lecture	Chalernporn
Sep 11, 2025			
Self-study			
Sep 12, 2025			
Nucleic Acid-based Technologies	9.00 – 11:30 AM	Lecture	Apinunt/Kittiphong
Protein-based Technologies	1.30-4.00 PM	Lecture	Duangnapa/Ittipat
Sep 15, 2025			

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Topic/Details	Time	Class Activity	Lecturer
DNA Extraction, PCR, and Agarose Gel Electrophoresis	9.00 – 11:30 AM	Lab	Chalernporn, Chutima, Alisa, Phatchariya
	1.30-4.00 PM	Lab	
Sep 16, 2025			
DNA Cloning (using <i>E. coli</i> for propagation and recombinant selection)	9.00 – 11:30 AM	Lab	Chalernporn, Poochit, Ittipat
	1.30-4.00 PM	Lab	
Sep 17, 2025			
Bacterial transformation and DNA sequencing analysis	9.00 – 11:30 AM	Lab	Kusol, Alisa, Apinunt, Chutima
	1.30-4.00 PM	Lab	
Sep 18, 2025			
Protein Extraction (purification) and SDS-PAGE (expression in <i>E. coli</i>)	9.00 – 11:30 AM	Lab	Panadda, Duangnapa, Ittipat
	1.30-4.00 PM	Lab	
Sep 19, 2025			
Problem-based learning presentation	10.00 AM-12.00 PM	Group presentation	All teaching staff
Reflection and After-Action Review (AAR)	1.30-2.00 PM	AAR	Panadda

Assessment Criteria:

Assessment Criteria	Assessment Method	Scoring Rubric
Assignment 30%	(1) Quizzes/exercises (2) Assignment	(1) Comprehension

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Assessment Criteria	Assessment Method	Scoring Rubric
Problem-based learning presentation 20%	(1) Problem-based presentation	(1) Ability to apply knowledge to solve research problems (2) Ability to answer questions
Laboratory performance/ Laboratory report/ Lab notebook 30%	(1) Direct observation (2) Practical examination/Quizzes (3) In-class/on-line discussion (4) Short presentation (1) Reports (2) Lab notebooks	(1) Ability to follow procedure or to design a procedure for an experiment (2) Use of equipment (3) Working area and safety (4) Report writing (5) Report submission time (6) Presentation of data (7) Data analysis and conclusion (8) Lab notebook
Class participation, Group presentation, Group assignment 20%	(1) Direct observation (2) Short presentation	(1) Class participation (2) Group work (3) Assigned work submission time (4) Group presentation

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Learning Outcomes	Evaluation Method				Weight (Percentage)
	Assignment	Problem-based learning presentation	Lab performance /Report/Lab notebook	Group presentation/ Discussion/Class participation	
CLO1 Integrate and apply the comprehensive knowledge of molecular biology to address scientific research questions	30	20	-	-	50
CLO2 Develop practical research skills by conducting molecular biology experiments, analyzing and presenting lab findings using appropriate information and	-	-	20	-	20

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communication tools					
CLO3 Demonstrate scientific integrity, safety practice, and responsibilities for the work assignments	-	-	10	-	10
CLO4 Demonstrate leadership, teamwork, research communication, and interpersonal skills	-	-	-	20	20
total	30	20	30	20	100

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

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0-49	F	Fail
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Assignment Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
1. Organization (10 %)	The writing demonstrated strong logic and thinking skills. Unity effectively brought readers to a conclusion and stimulated thought on the topic.	The writing was rationally arranged, with transitions between ideas and paragraphs to ensure consistency.	The writing was clear and ordered. Some points were misplaced beyond the topic. Transitions appeared but were not used throughout the essay.	The writing lacked logical organization. Although coherent, the ideas lacked unity. There were some serious errors.
2. Level of content (10 %)	The content demonstrated a synthesis of concepts, in-depth analysis, and creative thought and supported the subject.	The content demonstrated creative thinking and strong evidence-based concepts.	The content reflected some innovative thinking and reasoning on certain ideas.	While there was some thought and reasoning, most of the concepts were undeveloped and unoriginal.
3. Grammar and format (8 %)	The essay was free from spelling, punctuation, and grammatical problems. Met all formal and assignment criteria.	The essay had few spelling, punctuation, and grammatical errors. Met format and assignment requirements	The essay had some spelling, punctuation, and grammatical errors. Some errors in format appeared.	Errors in spelling, punctuation, and grammar made reading difficult. Failed to follow format and assignment requirements
4. Report Submission time (2 %)	The assignment was sent on time.	The assignment was sent one day late.	The assignment was sent two days late.	The assignment was sent more than two days late.
Total	Total points earned =			

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Assignment Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
(30 %)				

Problem-based learning Presentation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs to Improve (1)
1. Scientific background (4%)	The main ideas were presented in depth and detail, and all key elements were included. The experimental design answered all questions, and the poster contained accurate information.	The main ideas were presented with appropriate depth and details. Most key elements were included. Experimental design answered almost all questions. The poster contained a few mistakes.	The main ideas were presented but not completely or with superficial details. Some key elements were missing. The experimental design answered some questions. The poster contained some mistakes.	The main ideas were not presented, and there were no details. Most key elements were missing. The experimental design could not directly answer questions. The poster contained many mistakes.
2. Innovative and creative ideas (4%)	The presenter extended a novel or unique idea/ product to create a new knowledge by integrating alternative, or diverse perspectives. The presenter transformed ideas or solutions into entirely new forms.	The presenter recognized and incorporated some alternative or diverse perspectives. The presenter experimented with creating a novel or unique idea /product and made some efforts to synthesize new ideas or solutions.	The presenter incorporated a few alternative perspectives. The presenter experimented with creating a novel or unique idea /product and made little effort to synthesize new ideas or solutions.	The presenter used only a single approach to solve the problem. The presenter reformulated a collection of already available ideas.
3. Presentation skills (4%)	Delivery was clear and smooth, with good language skills. The	Delivery was clear and smooth, with good language skills.	The delivery had some broken sentences. Visuals	The delivery had many broken sentences and was not clear. Visuals were not

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Problem-based learning Presentation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs to Improve (1)
	visuals were attractive and effectively enhanced the presentation. The length of the presentation was within the assigned time limits.	Visuals were appropriately used to enhance the presentation. The length of the presentation was one minute over the assigned time limit.	were not well used to enhance the presentation, and it was more than one minute over the assigned time limit.	used to enhance the presentation. The length of the presentation was a few minutes over the assigned time limits.
4. Debate and argument skills (4%)	The presenter debated and responded to questions confidently and completely.	The presenter debated and responded to most questions but needed some clarification.	The presenter debated and responded to some questions but always needed some clarification.	The presenter could not debate and respond to most questions.
Total (20 %)	Total points earned =			

Lab Performance Evaluation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
1. Ability to Follow Procedure or to Design a Procedure for Experiment (10 %)	Actively followed the instructions in the procedure without assistance. Showed ability to perform additional experiments or tests beyond what was required in the procedure.	Followed the instructions in the procedure with little or no assistance. If the procedure was not provided, the student was able to determine an appropriate experiment to satisfy the lab objectives.	Had difficulty with some of the instructions in the procedure and needed clarification from the instructor or lab partner. If the procedure was not provided, the student needed some guidance about experiments to	Had difficulty reading the procedure and following the directions. Several mistakes were made during the experiment. If the procedure was not provided, student was incapable of designing a set of experiments to satisfy the given lab objectives.

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Lab Performance Evaluation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
			perform to satisfy the lab objectives.	
2. Use of Equipment (5 %)	Showed proper techniques for handling tools and lab equipment without error.	Showed proper techniques for handling tools and lab equipment with a few minor errors.	Showed adequate care for handling tools and lab equipment with some minor errors.	Showed improper techniques for handling some major errors.
3. Working Area and Safety (5 %)	The experiment was carried out with full attention to relevant safety procedures & directions. No incident occurred. Outstanding job on cleaning up the working area, tools, and equipment. Lab tools were organized and stored with care.	The experiment was generally carried out with attention to relevant safety procedures & directions. No incident occurred. Good job on cleaning up the working area, tools, and equipment. Lab tools were properly stored.	The experiment was carried out with some attention to relevant safety procedures & directions. A few incidents occurred. Had to be reminded to clean up area and equipment. Sometimes showed disorganized storage of lab tools.	Safety procedures were ignored. Did not follow directions. Several incidents occurred. Did not clean up area and equipment after work. Showed disorganized storage of lab tools.
Total (20 %)	Total points earned =			

Lab Report/ Lab notebook Evaluation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
1. Writing Style (2%)	The report was neat and well organized, with minimum spelling errors.	The report was neat and appropriately organized, with a few spelling errors.	The report was somewhat neat and organized, with some spelling errors.	The report was disorganized, with many spelling errors.

Lab Report/ Lab notebook Evaluation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
2. Report Submission time (1%)	The report was sent on time.	The report was sent one day late.	The report was sent two days late.	The report was sent more than two days late.
3. Presentation Of Data (2%)	Experimental data was clearly presented with tables, diagrams, pictures, or graphs that effectively present the experimental data. Results were shown in clear detail, and graphical data were labeled accurately.	Experimental data was presented in an appropriate format with only a few minor errors or omissions. Showed clear detail of results and graphical data were labelled accurately.	Experimental data was presented in an appropriate format, but some significant errors were noticed. Some tables and graphical data could be better organized, and some units, labels, and titles were missing.	Experimental data was poorly presented. Graphs or tables were poorly constructed and had several errors. Data was missing or incorrect. Some units, labels, and titles were not included.
4. Data Analysis and Conclusion (2%)	Reasonable scientific explanations for the results were discussed and logically analyzed. The conclusion was well-written and provided a complete answer to the question or hypothesis. It described what was learned, possible sources of error, and good suggestions for improving the	Scientific explanations for the results were given. The conclusion was appropriately written with a possible answer to the question or hypothesis. Provided description of what was learned, possible sources of error, and suggestions for improving the experiment and application.	Scientific explanations for the results were given, but they were neither complete nor accurate. The conclusion was written with an inaccurate answer to the question or hypothesis. A description of what was learned, possible sources of error, and suggestions for improving the	The scientific explanation for the results was neither complete nor accurate. The conclusion was poorly written and inaccurate, answering the question or hypothesis incorrectly. A description of what was learned, possible sources of error, and suggestions for improving the experiment and application were missing.

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Lab Report/ Lab notebook Evaluation Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Need to Improve (1)
	experiment and application.		application were missing.	
5. Lab notebook (3%)	The lab notebook was completed, including procedures for each experiment, calculation, results, and conclusion.	The lab notebook was sufficiently complete, with only minor omissions.	The lab notebook had partial information with major omissions.	The lab notebook was incomplete and difficult to understand.
Total (10 %)	Total points earned =			

Class participation, Group presentation, Group assignment Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs to Improve (1)
1. Class participation (2 %)	Used time well in class and focused attention on the lecture and experiments. Actively participated in the group and in classroom discussions.	Used time pretty well. Stayed focused on the lecture and experiments most of the time. Usually provided useful ideas when participating in the group and in classroom discussion.	Focused on the class but did not appear very interested. Sometimes provided useful ideas when participating in the group and in classroom discussion.	Participation was minimal. Rarely provided useful ideas when participating in the group and in classroom discussions.
2. Group work (2%)	Shared a lot of work with others. Gave ideas and helped others to complete the assigned work.	Shared equal work as others. Gave ideas and completed the assigned work in the group.	Did almost as much work as others. Sometime gave ideas and asked for help from others.	Did less work than others. Did not give ideas or ask for help from others.
3. Assigned work	Completed assigned work on time.	Completed assigned work one day late.	Needed some reminding; work	Needed much reminding; work

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Class participation, Group presentation, Group assignment Rubric				
Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs to Improve (1)
submission time (2%)			was late but no more than two days.	was late more than two days.
4.Group presentation (2%)	The presentation was well organized, and easy to follow. All of the group members contributed equally to the presentation.	The presentation had good organization. Everyone gave some presentation but someone gave more contribution than others.	The presentation could be better organized. Certain people did not do as much work as others.	The presentation lacked organization. A few people or only one person worked on the presentation.
Total (10 %)	Total points earned =			

Revised Date: XXX