COURSE TITLE: ENVIRONMENTAL AWARENESS ACTIVITY

COURSE CODE: MBT 21102

CREDITS: 2

DEPARTMENT: MSC. BIOTECHNOLOGY

Programme Outcomes – (M. Sc.)

- **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.
- **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.
- **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.
- **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.

- **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.
- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

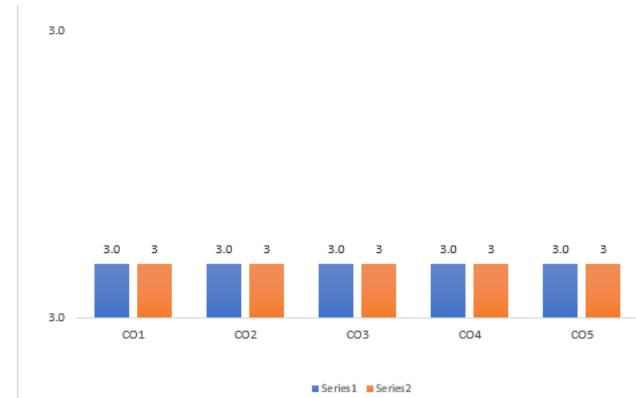|	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explains the basics of genetics, Mendel's laws and dominance-recessive relationships	UNDERSTANDING
CO2	**CO2:** Gives detailed information about chromosomes and pedigree analysis in man	ANALYZE
CO3	**CO3:** Explains the variations in chromosomal structure and numbers	EVALUATING
CO4	**CO4:** Describes linkage and gene mapping concepts	UNDERSTANDING
CO5	**CO5:** Clearly gives information about Organellar inheritance in contrast to Mendelian inheritance	APPLY

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific Outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1					H								
2			H										

3			H							H	H		
4	H			H				H					
5		H		H							H		

H: Highly Supportive   **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

Chart: Series1, Series2 — CO1, CO2, CO3, CO4, CO5 (all values 3.0 / 3)

CO	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		co wise internal average	External Exam		co wise external average	co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level		
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

OUTCOME	PO1		PO2	PO3		PO4		PO5		PO6	PO7		PO8	
CO1	H	3		H	3									
CO2	H	3		H	3	H	3				H	3		
CO3	H	3		H	3	H	3	H	3		H	3		
CO4	H	3		H	3	H	3				H	3		
CO5	H	3		H	3	H	3						H	3
AVERAGE OF COS FOR POS	3			3		3		3			3		3	
AVERAGE OF POS	3			3		3		3			3		3	
AVERAGE								3						

COURSE TITLE: GENETICS **COURSE CODE: MBT 21103** **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY
Programme Outcomes – (M. Sc.) ● **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering & Technology fundamentals to solve the complex problems. ● **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. ● **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. ● **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities. ● **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development. ● **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams. ● **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation. ● **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explains the basics of genetics, Mendel's laws and dominance-recessive relationships	UNDERSTANDING
CO2	**CO2:** Gives detailed information about chromosomes and pedigree analysis in man	APPLY
CO3	**CO3:** Explains the variations in chromosomal structure and numbers	UNDERSTANDING
CO4	**CO4:** Describes linkage and gene mapping concepts	UNDERSTANDING
CO5	**CO5:** Clearly gives information about Organellar inheritance in contrast to Mendelian inheritance	APPLY

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific Outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1								S		H			

2	S		H										
3		S	H							H		S	
4	H			S					S				
5		H		H									

H: Highly Supportive   **S: Supportive**

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
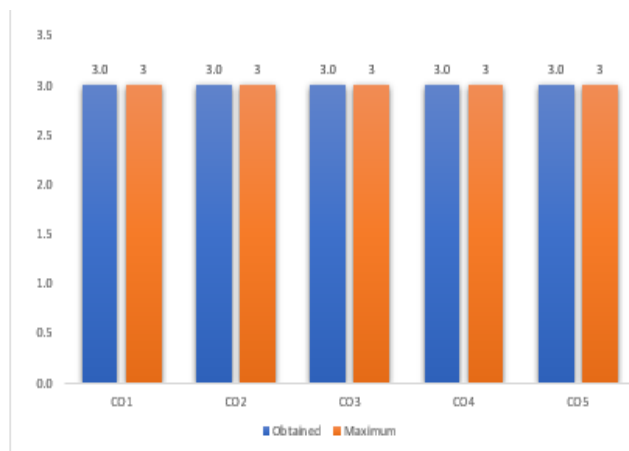**Pass percent between 75% - 85%= 2**
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

CO	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		External Exam				
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8	
CO1																
CO2					H	3										
CO3					H	3										
CO4	H	3														
CO5			H	3			H	3								
AVERAGE OF COS FOR POS	3		3		3		3									
AVERAGE OF POS		3		3		3		3								
AVERAGE							3									

COURSE TITLE: CELL BIOLOGY   **COURSE CODE: MBT21104**   **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY

Programme Outcomes – (B.Sc)

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**

- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

- **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

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- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in lifelong learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Structures and purposes of basic components of prokaryotic and eukaryotic cells, especially membranes, and organelles.	CREATE
CO2	**CO2:** How the cellular components are used in protein sorting through various pathways.	EVALUATE
CO3	**CO3:** How Cell Signalling Works and how cells will communicate with the surrounding cells & can have a clear understanding of the signal	EVALUATE
CO4	**CO4:** Cellular components underlying mitotic cell division	UNDERSTAND
CO5	**CO5:** The knowledge how the cells undergo apoptosis and its applications	EVALUATE

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
1	H		H						H	H		H	
2	H	H	S	H					S			H	

3		S	S	S				H	S	S		H	
4		H		H					S			S	
5		H						H	H	H		H	

<p style="text-align:center">**H: Highly Supportive**   **S: Supportive**</p>
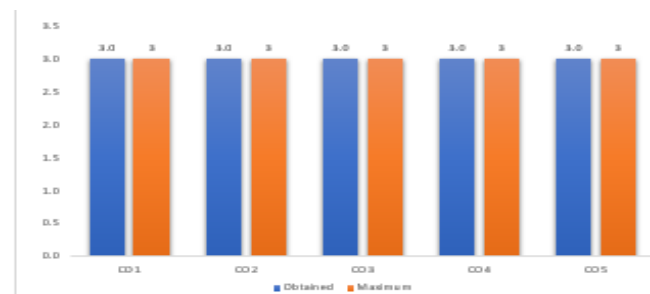
Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
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Pass percent of less than 65%= 0

co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE			External Exam			co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

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OUTCOME	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8	
CO1	H	3			H	3										
CO2	H	3	H	3			H	3								
CO3															H	3
CO4			H	3			H	3								
CO5			H	3											H	3
AVERAGE OF COS FOR POS	3		3		3		3								3	
AVERAGE OF POS	3		3		3		3								3	
AVERAGE	3															

MAPPING COURSE OUTCOMES LEADING TO THE ACHIEVEMENT OF PROGRAM OUTCOMES:

COURSE TITLE: BIOCHEMISTRY
COURSE CODE: MBT21105
CREDITS: 4
DEPARTMENT: MSC. BIOTECHNOLOGY

Programme Outcomes – (M.Sc)

- **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.**

- **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

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- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):
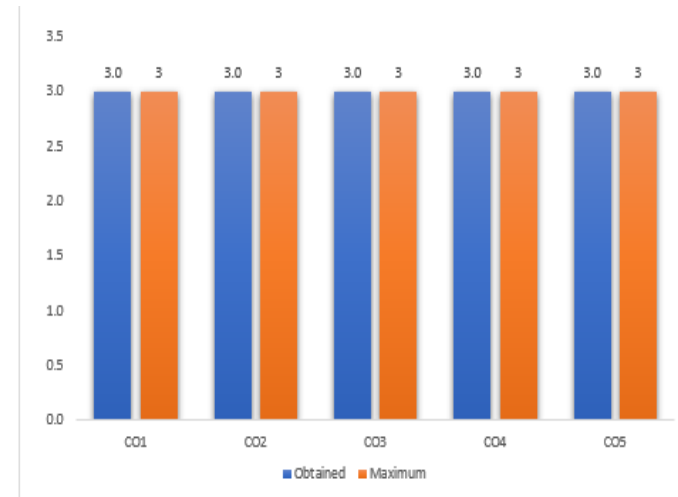
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- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in lifelong learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explains Chemical bonds, molecular interactions in cell	UNDERSTAND
CO2	**CO2:** Apply the knowledge of bonds &shows in representing structure of carbohydrates	APPLY
CO3	**CO3:** Identifies the structure of lipids, relates &distinguishes with carbohydrates.	UNDERSTAND
CO4	**CO4:** Compares, discriminates the structure &functional relationship of proteins & nucleic acids with other biomolecules in cell.	ANALYZE
CO5	**CO5:** Explains the catalytic nature & kinetic properties &inhibition mechanisms of enzymes.	UNDERSTAND

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H		H							H		S	
2	H	S	H	H				H			S	S	
3	S		S	H			S	H	H		S		
4	H	S		H		S			S	H		H	
5		S						H	H	H		H	

Table 2: COURSE OUTCOME ATTAINMENT

co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		co wise internal average	External Exam		co wise external average	co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level		
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS:

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

OUTCOME	PO1		PO2	PO3		PO4		PO5	PO6	PO7	PO8	
CO1	H	3		H	3							
CO2	H	3		H	3	H	3				H	3
CO3						H	3				H	3
CO4	H	3				H	3					
CO5											H	3
AVERAGE OF COS FOR POS	3			3		3					3	
AVERAGE OF POS	3			3		3					3	
AVERAGE	3											

DEPARTMENT OF M.SC BIOTECHNOLOGY COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES:

COURSE TITLE: MICROBIOLOGY
COURSE CODE: MBT21106
CREDITS: 4
DEPARTMENT: COMPUTER SCEINCE AND ENGINEERING
PROGRAMME OUTCOMES: **BSC** • **PO1. Scientific Knowledge.** Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems**.** • **PO2**. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. • **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. • **PO4.Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.

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PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

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	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explains the basics of Microbiology. Different media used for their culturing and their identification methods	UNDERSTAND
CO2	**CO2:** Gives detailed information about systemic classification of Bacteria, Algae, Archae and Fungi	REMEMBER
CO3	**CO3:** Explains in detail about microbial physiology and their growth	UNDERSTAND
CO4	**CO4:** Describes about microbial genetics like Transformation, Transduction, and recombination	UNDERSTAND
CO5	**CO5:** Clearly gives information about classification of viruses and chemotherapeutic agents.	REMEMBER

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1			H				S	H		H	H	H	

2	H	S	S	H				H	S	S	S	H	
3	H	S		H		S		H		H	S	H	
4	S	S	H				S	H		S	S	H	
5		H	S	S	S			S	S	H	S	H	

H: Highly Supportive   **S: Supportive**
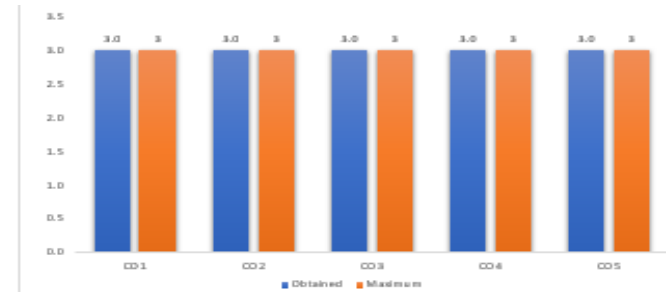
Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:
Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

CO	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		co wise internal average	External Exam		co wise external average	co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level		
CO1	97.1	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	97.1	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	97.1	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

 Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4		PO5	PO6	PO7	PO8	
CO1					H	3						H	3
CO2	H	3					H	3				H	3
CO3	H	3					H	3				H	3
CO4					H	3						H	3
CO5			H	3									
AVERAGE OF COS FOR POS	3		3		3		3					3	
AVERAGE OF POS	3		3		3		3					3	
AVERAGE	3												

DEPARTMENT OF M.SC BIOTECHNOLOGY COURSE OUTCOME MAPPING

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: BIOSTATISTICS, ETHICAL ISSUES & RESEARCH METHODOLOGY   **COURSE CODE: MBT 21202**   **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY
Programme Outcomes – (M. Sc.)   • **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems.   • **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.   • **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.   • **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities.   • **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.   • **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams.   • **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation.

- **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL

CO1	**CO1:** Introduction to Bio-Statistics	UNDERSTANDING
CO2	**CO2:** Descriptive Statistics & Probability Distribution	REMEMBERING
CO3	**CO3:** Statistical Inference of Qualitative & Quantitative Variables	UNDERSTANDING
CO4	**CO4:** It describes importance of ethics in life. It valuates good laboratory and manufacturing practices.	UNDERSTANDING
CO5	**CO5:** Integrates training from different sources to solve a problem during research and writing a publication	APPLYING

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	PSO5
1	H								H				
2			H							H			

3			H						H			
4				H							H	
5							H				H	

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE			External Exam			
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	co wise internal average	pass%	Attainment level	co wise external average	co wise total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2	PO3		PO4	PO5		PO6	PO7	PO8	
CO1	H	3										
CO2				H	3							
CO3				H	3							
CO4							H	3				
CO5											H	3
AVERAGE OF COS FOR POS	3			3			3				3	
AVERAGE OF POS		3		3			3					3
AVERAGE	3											

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: IMMUNOLOGY **COURSE CODE: MBT 21203** **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY
<u>**Programme Outcomes – (M. Sc.)**</u>   • **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems. • **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. • **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. • **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities. • **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development. • **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams. • **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation. **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explains the basics of immunology	REMEMBER

CO2	**CO2:** Gives detailed information about antigens and their pathways	UNDERSTAND
CO3	**CO3:** It gives knowledge about various types of Imunoglobulin structures their and functions	UNDERSTAND
CO4	**CO4:** explains about Organization of MHC complex and Transplantation	ANALYZE
CO5	**CO5:** Summarizes about cell mediated and humoral responses and auto immune diseases	ANALYZE

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific Outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	
1	H								H				
2			H							H			
3			H							H			

								H				H	
4													
5								H				H	

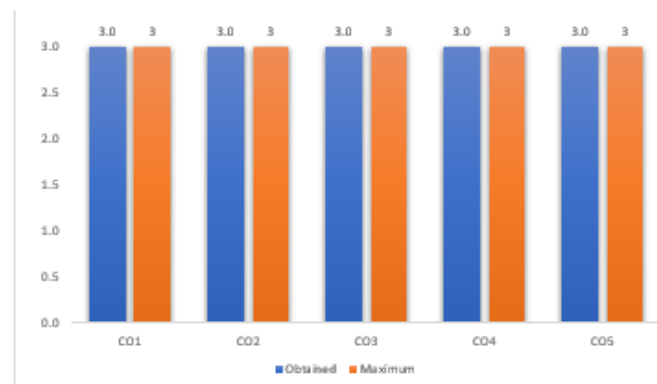**Table 2: COURSE OUTCOME ATTAINMENT**

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		co wise internal average	External Exam		co wise external average	co wise total average
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level		
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

 Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2	PO3		PO4	PO5	PO6	PO7	PO8	
CO1	H	3									
CO2				H	3						
CO3				H	3						
CO4										H	3
CO5										H	3
AVERAGE OF COS FOR POS	3			3						3	
AVERAGE OF POS	3			3						3	
AVERAGE	3										

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: MOLECULAR BIOLOGY-I THE GENOME **COURSE CODE: MBT 21204** **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY
Programme Outcomes – (M. Sc.)   • **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems. • **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. • **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. • **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities. • **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development. • **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams. • **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation. **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Know the life with molecular functionalities, chemical and molecular processes that occur in and between cells.	REMEMBER

CO2	**CO2:** Genome Organization from prokaryotes to Eukaryotes.	UNDERSTAND
CO3	**CO3:** Genome Replication in from prokaryotes to Eukaryotes.	ANALYZE
CO4	**CO4:** Knowledge about the changes or losses in cell function, includes alterations of cell function brought about by mutations and DNA repair	UNDERSTAND
CO5	**CO5:** How genes are evolved by gene rearrangements and recombination and by transposons.	APPLY

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**P08**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
1	H								H				
2		H							H				
3		H							H				
4			H	H					H	H			

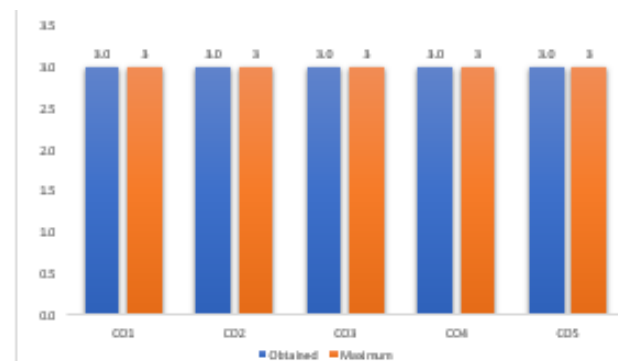| 5		H		H				H	H	H			

H: Highly Supportive

S: Supportive

Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:

Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

CO	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		External Exam				
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	course internal average	pass%	Attainment level	course external average	course total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4		PO5	PO6	PO7	PO8	
CO1	H	3											
CO2			H	3									
CO3			H	3									
CO4					H	3	H	3					
CO5			H	3			H	3				H	3
AVERAGE OF COS FOR POS	3		3		3		3					3	
AVERAGE OF POS		3		3		3		3					3
AVERAGE	3												

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: MOLECULAR BIOLOGY II-GENES TO PROTEINS **COURSE CODE: MBT 21205** **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY
Programme Outcomes – (M. Sc.)   - **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems. - **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. - **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. - **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities. - **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development. - **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams. - **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation. **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.
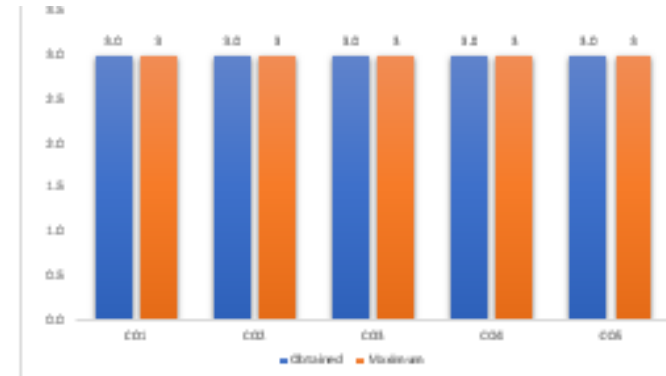
	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Know the life with molecular functionalities, chemical and molecular processes that occur in and between cells.	REMEMBER

CO2	**CO2:** Concept of gene structure and function, gene expression and gene regulation at transcriptional level	UNDERSTAND
CO3	**CO3:** Concepts of translation and gene expression	UNDERSTAND
CO4	**CO4:** Gene regulation at translational level.	UNDERSTAND
CO5	**CO5:** Development of solid foundation and requisite research aptitude for further higher studies on epigenetic analysis.	APPLYING

Table 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H							H	H				
2	H							H	H				
3	H		H					H	H				
4	H		H					H	H	H			
5			H	H				H	H	H			

Table 2: COURSE OUTCOME ATTAINMENT

	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE			External Exam			
	passX	Attainment level	passX	Attainment level	passX	Attainment level	passX	Attainment level	passX	Attainment level	passX	Attainment level	session internal average	passX	Attainment level	session external average	session total average
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2	PO3		PO4		PO5	PO6	PO7	PO8	
CO1	H	3									H	3
CO2	H	3									H	3
CO3	H	3		H	3						H	3
CO4	H	3		H	3						H	3
CO5				H	3	H	3				H	3
AVERAGE OF COS FOR POS	3			3		3					3	
AVERAGE OF POS		3		3		3						3
AVERAGE							3					

MAPPING COURSE OUTCOMES LEADING TO THE ATTAINMENT OF PROGRAM OUTCOMES

COURSE TITLE: r-DNA TECHNOLOGY **COURSE CODE: MBT 21206** **CREDITS: 4**
DEPARTMENT: MSC. BIOTECHNOLOGY
Programme Outcomes – (M. Sc.)   - **PO1. Scientific Knowledge**: Apply the knowledge of Science, Mathematics, Engineering& Technology fundamentals to solve the complex problems. - **PO2. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. - **PO3.Problem analysis:** Identify, formulate, research literature, and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. - **PO4. Modern tool usage:** Create, select and apply appropriate techniques, resources, modern technology and IT tools to complex science and technological activities. - **PO5. Environment and sustainability:** Understand the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development. - **PO6.Individual and team work:** Function objectively as an individual and as a member in diverse teams. - **PO7. Communication:** Communicate effectively on complex science & technology activities with society at large and able to write effective reports and documentation. **PO8. Life-long learning:** Recognise the need and ability to engage in independent and lifelong learning in the context of technological change.

PROGRAMME SPECIFIC OUTCOMES (DEPARTMENTAL):

Students will be able to:

- **PSO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision making in process of quality education.

- **PSO2: Problem Analysis:** Identify, formulate and analyse the complex scientific problems using the knowledge gained across various streams of science and technology.

- **PSO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.

- **PSO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self discipline for prominent career in industry, research institutes and for further academic study.

- **PSO5: Life Long Learning and Social Responsibility:** Recognise the need and ability to engage in life long learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.

	COURSE OUTCOMES	BLOOM'S TAXONOMY LEVEL
CO1	**CO1:** Explains usage of enzymes in molecular cloning	UNDERSTAND

CO2	**CO2:** Apply the principles of Vectors used in molecular cloning	APPLY
CO3	**CO3:** Illustrates Construction of Genomic and cDNA Libraries	ANALYZE
CO4	**CO4:** Describes Techniques employed in molecular cloning	REMEMBER
CO5	**CO5:** Relates Selection and Analysis of recombinant Clones	APPLY

TABLE 1: CO, PO, PSO MAPPING

Course outcomes	Programme Outcomes								Program Specific outcomes				
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	P08	PSO1	PSO2	PSO3	PSO4	
1	H	H						H	H				
2	H	H						H	H				
3	H			H				H	H	H	H		

4	H	H	H	H				H	H	H	H		
5	H	H	H	H				H	H	H	H		

H: Highly Supportive   **S: Supportive**

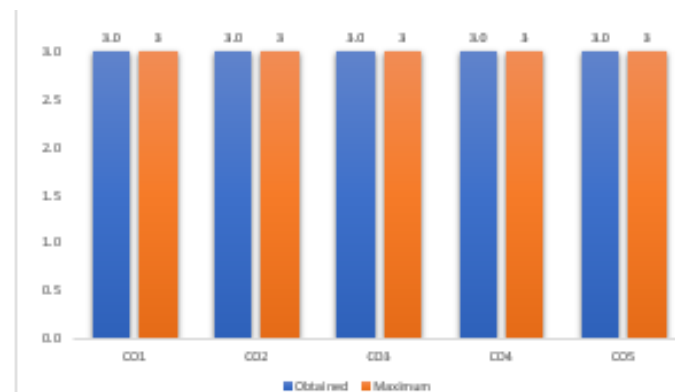## Table 2: COURSE OUTCOME ATTAINMENT

ATTAINMENT SCALE:
Pass percent of 85% and above= 3
Pass percent between 75% - 85%= 2
Pass percent between 75%- 65%= 1
Pass percent of less than 65%= 0

co	WEEKLY TEST		MID SEM		PREFINAL		ASSIGNMENT		VIVA-VOCE		ATTENDENCE		co wise internal	External Exam			co wise total
	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level	pass%	Attainment level		pass%	Attainment level	co wise external average	
CO1	100.0	3.0			100.0	3.0	100.0	3.0	100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO2	100.0	3.0			100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO3	100.0	3.0	100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO4			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0
CO5			100.0	3.0	100.0	3.0			100.0	3.0	100.0	3.0	3.0	100.0	3.0	3.0	3.0

AVERAGE	AVERAGE
3	3

RESULT ANALYSIS: (Only write a comment on the total CO attainment for the course and areas of improvement, how less it is from 3, which exam are they losing marks in, how can we attain 3)

The total CO attainment of the course is satisfactory. Performance in the mid semester exam needs to improve to improve overall course outcome attainment level.

Table 3: PROGRAMME OUTCOME MAPPING

 Instruction:

1. Copy the completed table 1.

2. Retain only the POs and the Highly supportive (H) points. [Delete the PSO columns and the 'S' points]

3. Write the respective CO-wise total average (column K in table 2) wherever each CO is mapped as (H) under each PO.]

OUTCOME	PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8	
CO1	H	3	H	3											H	3
CO2	H	3	H	3											H	3
CO3	H	3					H	3							H	3
CO4	H	3	H	3	H	3	H	3							H	3
CO5	H	3	H	3	H	3	H	3							H	3
AVERAGE OF COS FOR POS	3		3		3		3								3	
AVERAGE OF POS		3		3		3		3								3
AVERAGE	3															