MAHATMA GANDHI UNIVERSITY, KERALA

Abstract

Bachelor of Science (Honours) Biotechnology - Fourth Semester - Modifications to the Course Outcomes, Course Content and Mode of Assessment - Approved - Orders Issued.

ACA 16

No. 332/ACA 16/2026/MGU Priyadarsini Hills,Dated: 12.01.2026

Read:-1. U.O.No.5797/AC A16/2024/MGU, dated.27.06.2024.

2. Minutes of the meeting of the Expert Committee on Biotechnology (UG).

3. Orders of the Vice Chancellor under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, dated.10.01.2026

ORDER

The syllabi of various Honours Under Graduate Programmes coming under The MGU-UGP (Honours) Regulations, 2024, have been approved vide paper read as (1) above and published on the website of the University.

The Expert Committee on Biotechnology (UG), discussed the need to modify the Course Outcomes, Course Content and Mode of Assessment of DSC/DSE/SEC/VAC type courses. Also recommended to modify the Suggested Readings of SEC and VAC type courses and to include Credits in the detailed syllabus page of the course MG4DSEBTG200: Biosafety and Bioethics, in the Fourth Semester syllabus of the Bachelor of Science (Honours) Biotechnology programme, and has submitted recommendations vide paper read as (2) above.

(Recommendations are attached as Annexure)

Considering the urgency, sanction has been accorded by the Vice Chancellor, in exercise of the powers of the Academic Council vested upon him under Section 10(17), Chapter III of the Mahatma Gandhi University Act 1985, vide paper read as (3) above, to approve the said recommendations.

Hence, the Course Outcomes, Course Content and Mode of Assessment of the said courses in the Fourth Semester syllabus of the Bachelor of Science (Honours) Biotechnology programme, stands modified to this extent.

Orders are issued accordingly.

SUDHA MENON J

ASSISTANT REGISTRAR III

(ACADEMIC)

For REGISTRAR

Copy To

1. PS to VC
2. PA to Registrar/CE
3. Convenor, Expert Committee, Biotechnology (UG)
4. JR 2 (Admin)/DR 2, AR 3 (Academic)
5. JR/DR/AR (Exam)
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File No. 67052/AC A16-3 /2025/ACA 16.

Forwarded / By Order

Section Officer

Annexure

Semester IV

Course Name: MOLECULAR BIOLOGY
Course Code: MG4DSCBTG200

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No. (Modified)	Page No
3	Describe the central dogma of molecular biology.	No Change	No Change	54
5	Able to perform DNA isolation, electrophoresis of DNA and protein, estimation of DNA and RNA and restriction digestion.	A	2,3	
6	Removed			

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs.	CO No(Modified)	Page No
2	2.1	No Change	No Change	3	55
	2.2			3	
	2.3			3	
	2.4			3	
	2.5			4	
3	3.1			3	
	3.2			3	
	3.3			3	
	3.4			4	
	3.5			4	
	3.6			4	
4	4.1			5	
	4.2			5	
	4.3			5	
	4.4			5	
	4.5			5	
	4.6			5	

	4.7			5	
5	Teacher Specific Content				

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
20+5 (for Teacher Specific Content) = 25 Marks	56

B. End Semester Evaluation (ESE)

1.Theory			
Max.Marks: 50			**Duration: 1.5Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	56
Short Essay	5 out of 7	5 x 4 = 20	
Essay	1 out of 2	1 x 10 = 10	

Course Name: IMMUNOLOGY
Course Code: MG4DSCBTG201

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No
1	Students will be able to identify and describe the major cells and organs involved in the immune system, antigen, haptens and immune responses.	K	No Change	58
2	Students will be able to communicate effectively about advanced immunological techniques and antigen-antibody reactions.	No Change		

3	Students will describe the Type I to Type IV hypersensitivity reactions			
4	Students will evaluate therapeutic interventions and immune - techniques in therapeutic applications and will learn the steps involved in generating and characterizing hybridomas for the production of monoclonal antibodies			
5	Students will gain practical exposure to blood cell counting, blood grouping and typing and agglutination and antigen-antibody reactions.			
6	Removed			
7				
8				

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs.	CO No(Modified)	Page No
1	1.1	No Change	No Change	1	58
	1.2			1	
	1.3			1	
	1.4			1	
2	2.1			2	
	2.2			2	
	2.3			2	
3	3.1			3	
	3.2			3	
	3.3			4	
4	4.1			5	59
	4.2			5	
	4.3			5	
	4.4			5	
	4.5			5	
5	Teacher Specific Content				

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
20+5 (for Teacher Specific Content) = 25 Marks	59

B. End Semester Evaluation (ESE)

1.Theory			
Max.Marks: 50			**Duration: 1.5Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	59
Short Essay	5 out of 7	5 x 4 = 20	
Essay	1 out of 2	1 x 10 = 10	

2. Practical		Page No
Max.Marks: 35	**Duration : 3 Hrs.**	59

Course Name: BIOSAFETY AND BIOETHICS
Course Code: MG4DSEBTG200

Course Details	Credits	4 (Included)	Page No : 61

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No.	Page No
3	No Change	A	No Change	61
5	Justify ethical principles in animal testing	No Change		
6	Removed			62

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs.	CO No(Modified)	Page No
1	1.4	No Change	No Change	3	62
	1.6			5	
3	3.3			5	
5	Teacher Specific Content				

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
25+5 (for Teacher Specific Content) = 30 Marks	63

B. End Semester Evaluation (ESE)

Theory			
Max.Marks: 70			**Duration: 2 Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	63
Short Essay	4 out of 6	4 x 5 = 20	
Essay	2 out of 4	2 x 15 = 30	

Course Name: BIOSTATISTICS
Course Code: MG4DSEBTG201

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified) Upon completion of this course in Biostatistics the students should be able to:	Learning Domains	PO No.	Page No
5	Removed			64

COURSE CONTENT

Content for Classroom Transaction (Units)

<table>
<tr><th>Module</th><th colspan="2">Units</th><th>Course Description</th><th>Hrs.</th><th>CO No (Modified)</th><th>Page No</th></tr>
<tr><td>1</td><td colspan="2">1.2</td><td rowspan="7">No Change</td><td rowspan="7">No Change</td><td>2</td><td rowspan="7">65</td></tr>
<tr><td rowspan="3">2</td><td colspan="2">2.1</td><td>3</td></tr>
<tr><td>Existing</td><td>Modified</td><td rowspan="2">No Change</td></tr>
<tr><td>3.2</td><td>2.3</td></tr>
<tr><td>3</td><td colspan="2">3.1</td><td>3</td></tr>
<tr><td rowspan="2">4</td><td colspan="2">4.1</td><td>4</td></tr>
<tr><td colspan="2">4.2</td><td>4</td></tr>
<tr><td>5</td><td colspan="5">Teacher Specific Content</td></tr>
</table>

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
25+5 (for Teacher Specific Content) = 30 Marks	66

B. End Semester Evaluation (ESE)

Theory			
Max.Marks: 70			**Duration: 2 Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	66
Short Essay	4 out of 6	4 x 5 = 20	
Essay	2 out of 4	2 x 15 = 30	

Course Name: TISSUE CULTURE TECHNIQUES
Course Code: MG4DSCBTG202

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome (Modified)	Learning Domains (Modified)	PO No. (Modified)	Page No
1	Trace the historical development and milestones in plant and animal cell culture. Demonstrate knowledge of basic requirements for successful plant and animal cell culture, including laboratory setup and equipment.	U	1,2,3,6	68
2	Analyze the composition of culture media, media preparation, sterilization techniques in plant and animal tissue culture techniques.	No Change	2,3,10	
3	Evaluate the advantages and applications of various plant tissue cultures, including propagation of plants through totipotency stages, organogenesis, somatic embryogenesis, Haploid production, somaclonal variation, and hybridization techniques.	E	No Change	
4	Differentiate between primary and secondary cell cultures, and maintain established/continuous cell lines. Apply animal cell culture in the production of monoclonal antibodies, vaccines, specific metabolites, and transgenic animals	A	2,3,6,8	
5	Able to perform comprehensive skill set in plant tissue culture methodologies.	S	2,3,6,10	
6	Removed			
7				
8				
9				

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs.	CO No (Modified)	Page No
1	1.1	No Change	No Change	1	68
	1.2			1	
	1.3			2	69
	1.4			3	
2	2.1			3	
	2.2			3	
	2.3			3	
	2.4			3	
	2.5			3	
3	3.1			1	
	3.2			2	
	3.3			4	
	3.4			4	
4	4.1			5	70
	4.2			5	
	4.3			5	
	4.4			5	
	4.5			5	
5	Teacher Specific Content				

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
20+5 (for Teacher Specific Content) = 25 Marks	70

B. End Semester Evaluation (ESE)

1.Theory			
Max.Marks: 50			**Duration: 1.5Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	70
Short Essay	5 out of 7	5 x 4 = 20	
Essay	1 out of 2	1 x 10 = 10	

2. Practical		Page No
Max.Marks: 35	**Duration : 3 Hrs.**	70

Course Name: QUALITY CONTROL IN BIOLOGY
Course Code: MG4SECBTG200

Programme	BSc (Hons) Biotechnology	**Page No** : 72

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs.	CO No (Modified)	Page No
2	2.1	No Change	No Change	3	73
	2.2			3	
3	3.1			4	
	3.3			4	
	3.4			5	
4	Teacher Specific Content				

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
20+5 (for Teacher Specific Content) = 25 Marks .	74

B. End Semester Evaluation (ESE)

1.Theory			
Max.Marks: 50			**Duration: 1.5Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	74
Short Essay	5 out of 7	5 x 4 = 20	
Essay	1 out of 2	1 x 10 = 10	

Existing	Modified	Suggested Readings	Page No
3	1	Bioprocess Engineering Principles (1995) by Pauline M. Doran	74
4	2	Introduction to Statistical Quality Control" by Douglas C. Montgomery. WELEY Publications.	
5	3	Relevant research articles and case studies from reputable journals and regulatory agencies.	

Course Name: HUMAN RESOURCE MANAGEMENT IN BIOTECHNOLOGY

Course Code: MG4VACBTG200

Programme	BSc (Hons) Biotechnology	Page No : 75

COURSE OUTCOMES (CO)

CO No.	Expected Course Outcome	Learning Domains	PO No.	Page No
6	Removed			75

COURSE CONTENT

Content for Classroom Transaction (Units)

Module	Units	Course Description	Hrs.	CO No (Modified)	Page No
1	1.2	No Change	No Change	2	76
3	3.2			4	
	3.3			4	
	3.4			4	
	3.5			4	
4	Teacher Specific Content				

MODE OF ASSESSMENT (Modified)

A. Continuous Comprehensive Assessment (CCA)

Theory	Page No
20+5 (for Teacher Specific Content) = 25 Marks	77

B. End Semester Evaluation (ESE)

1.Theory			
Max.Marks: 50			**Duration: 1.5Hrs**
Type of Questions	**Number of Questions to be answered**	**Marks**	**Page No**
One Word Answer	10 out of 12	10 x 2 = 20	77
Short Essay	5 out of 7	5 x 4 = 20	
Essay	1 out of 2	1 x 10 = 10	

Existing	Modified	Suggested Readings	Page No
8	1	Pavitt, C. & Curtis, E. (2001). Small group discussion: A theoretical approach (3rd ed.). Retrieved from http://www.uky.edu/~drlane/teams/77avitt	77