



DEPARTMENT OF MICROBIOLOGY

MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

CURRICULUM FOR CERTIFICATE COURSE IN

CERMB005: BIO-CONTROL AGENTS

OFFERED DURING THE
ACADEMIC YEAR 2019-20
[APPROVED BY ACADEMIC COMMITTEE, MAMO COLLEGE]



MANASSERY, MUKKAM POST,
KOZHIKODE, KERALA, INDIA, 673 602.
EMAIL: MAMOCOLLEGE@GMAIL.COM



OFFICE: 0495-2297319
PRINCIPAL: 0495-2295121



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

CONTENTS		
1	INSTITUTIONAL VISION, MISSION & OBJECTIVES	3
2.	VISION, MISSION, OBJECTIVES & CORE VALUES OF THE DEPARTMENT	4
3.	B.Sc MICROBIOLOGY: PEOs	5
4.	B.Sc MICROBIOLOGY: PSOs	7
5.	B.Sc MICROBIOLOGY: POs	9
6.	CERMB005: COURSE CURRICULUM	12
6.1.	COURSE LEVEL	13
6.2.	PREREQUISITE	13
6.3.	COURSE INTAKE & ADMISSION	13
6.4.	COURSE COORDINATOR	13
6.5.	COURSE PREAMBLE	13
6.6.	DURATION	13
6.7.	CURRICULUM FOCUS	13
6.8.	COURSE OBJECTIVES	14
6.9.	SKILL EXPECTED	14
6.10.	COURSE OUTCOMES	14
6.11.	MAPPING OF COs WITH POs AND PSOs	15
6.12.	MODULE-WISE COURSE CONTENTS	15
6.13.	DELIVERY MODE	16
6.14.	DELIVERY SCHEDULE	16
6.15.	DETAILED COURSE DELIVERY PLAN	16
6.16.	ASSESSMENT COMPONENTS	19
6.17.	COURSE EVALUATION & GRADING	19
6.18.	GRIEVANCE REDRESSAL	20
6.19.	ISSUANCE OF CERTIFICATES	20



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

INSTITUTIONAL VISION, MISSION & OBJECTIVES 01



VISION

VISION: Build Scientifically Oriented, Intellectually Accomplished, Morally Upright and Socially Committed youth who can play a constructive role in Nation Building.



MISSION

MISSION: Intellectual, social and economic empowerment of the youth in general and women, minorities, orphans and the destitute in particular by providing quality, value-based higher-education.



OBJECTIVES

OBJECTIVES: Pursuit of Excellence, Harnessing technology, Thrust on value-based education, Nurturing Excellence and Moulding the youth for Nation Building.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

VISION, MISSION, OBJECTIVES & CORE VALUES OF THE DEPARTMENT 02



VISION

VISION: To brim the upcoming generation with Scientific Knowledge.



MISSION

MISSION: Providing quality education and training to bring out the very best in students through the stimulus of scholarly progression and intellectual development.



OBJECTIVES: (a) Empowerment of the students with scientific background and the technical skills, (b) Empower the students to be an entrepreneur in the field of Microbiology and allied areas.



VALUES

CORE VALUES: Accountability, Communication, inclusivity, innovation, Industrial excellence, Professionalism, Teamwork and tolerance.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

B.Sc MICROBIOLOGY: PROGRAMME EDUCATIONAL OBJECTIVES [PEOs] 03

After 4 to 5 years of graduation, the career and professional accomplishments attained by the Microbiology Graduates would reflect that the programme really prepared the graduates to deal with the real world, where they could apply and use the skills and knowledge they have learned to good use.

Specifically, the graduate would be able to:



PEO1: Pursue any of the following three alternatives: (i) immediately take up a career in any area of Microbiology and work productively as a successful microbiologist in diverse career paths including supportive and leadership roles on multidisciplinary teams. (ii) Broaden the scope of the career path by pursuing higher studies and research in the field of Microbiology. (iii) Go for taking up the challenge and spearheads start-ups by positively exploiting the diverse potentials of the microbiological field.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005



PEO2: Graduates will communicate effectively, recognize and incorporate societal needs and constraints in their professional endeavours, and practise their profession with high regard to legal and ethical responsibilities.



PEO3: Be original, creative, innovative and systematic in their all endeavours, including individual, collaborative and entrepreneurial ventures with meticulous strategic thinking, planning and execution.



PEO4: Have sufficient breadth of understanding to enable continued professional development and lifelong learning throughout their career.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

B.Sc MICROBIOLOGY: PROGRAMME SPECIFIC OUTCOME [PSOs] 04

On successful completion of a Bachelor Degree in Microbiology, the graduates would be able to:



PSO1: The students able to understand the theoretical knowledge in the field of microbiology like general, analytical, clinical, food and industrial sectors.



PSO2: The students able to expertise in applying practical knowledge in medical, biochemical and industrial sectors.



PSO3: The students acquire research knowledge in industrial training and summative projects.



PSO4: The students able to analyse socially acceptable solutions to complex environmental problems with applications of modern and appropriate techniques for sustainable development.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

**COORDINATOR
ACADEMIC COMMITTEE**
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005



PSO5: The students able to create bio products like microbial inoculums, biologically active compounds and probiotics.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

B.Sc MICROBIOLOGY: PROGRAMME OUTCOMES [POs] 05

The students graduating from B.Sc Microbiology Programme should be able to:



PO1: SCIENTIFIC & COMPUTING KNOWLEDGE: Apply scientific and practical methods to analyse microorganisms from different sources.



PO2: PROBLEM ANALYSIS: Identify, formulate, review research literature, and analyze complex real-life problems reaching substantiated conclusions using first principles of statistics, natural sciences, and bioinformatics.



PO3: DESIGN/DEVELOPMENT OF SOLUTIONS: Design solutions for complex real-life problems or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

**COORDINATOR
ACADEMIC COMMITTEE**
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005



PO4: CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.



PO5: MODERN TOOL USAGE: Apply appropriate and modern practical techniques, resources, and modern bioinformatics software including prediction and modeling to complex biomolecules with an understanding of the limitations.



PO6: THE MICROBIOLOGICAL PROFESSION AND SOCIETY: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice.



PO7: ENVIRONMENT AND SUSTAINABILITY: Understand the impact of the environmental pollutions and their solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.



PO8: ETHICS: Apply ethical principles and commit to professional ethics and responsibilities and norms of the microbiological practice.



PO9: INDIVIDUAL AND TEAM WORK: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.



PO10: COMMUNICATION: Communicate effectively on complex microbial activities with the community and



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121



www.mamocollege.org

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

with society, such as, being able to comprehend and write effective reports and analyse the microbial activities, make effective presentations, and give and receive clear instructions.



PO11: PROJECT MANAGEMENT AND FINANCE:

Demonstrate knowledge and understanding of the microbiological principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.



PO12: LIFE-LONG LEARNING: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of changing environment.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

CERTIFICATE COURSE

CERMB005: BIO-CONTROL AGENTS 06

COURSE CURRICULUM

Course Name	Bio-Control Agents
Course Code	CERMB005
Year	2019-20
Course Designer	Ms. Amrutha P
Couse Duration	30 Hrs
Course Schedule	June to September
Maximum Students Intake	60 Students



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

1. COURSE LEVEL

Foundational, skill-oriented certificate programme.

2. PREREQUISITE

Fundamental knowledge in Bio-control agents.

3. COURSE INTAKE & ADMISSION

Maximum 60 students will be given admission to the course based on First-Come-First-Serve basis. All the students of the MAMO College are eligible for free enrolment for the course. The enrolment notification will be issued for the course well in advance of the commencement of the course.

4. COURSE COORDINATOR

Ms. Amrutha P, Assistant Professor, Department of Microbiology.

5. COURSE PREAMBLE

Biological control or bio control is a method of controlling pests. The objective of bio control is to keep pest levels low enough to produce a successful crop. Major goal involves familiarising the students with the concept of biological control of practical use of natural enemies to reduce the damage caused by pests.

6. DURATION

Total Duration: 30 Hrs. [Contact Hrs. 16 Hrs, Course Woks: 7 and Assessment Works: 7]

7. CURRICULUM FOCUS

Enhance the employability of the learners through curriculum enrichment for



Manassery, Mulkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

additional skill development.

8. COURSE OBJECTIVES

Learners are expected to

- (a) Facilitate the students to understand the basics of bio control agents.
- (b) The production methods of bio control agents

9. SKILL EXPECTED

On the successful completion of the course, learners will be able to:

- (a) Handling, production, field application purposes of the bio control agents.
- (b) Achieve the details about beneficial micro organisms

10. COURSE OUTCOMES

Upon the successful completion of the course, the learners will be able to:

CO No	Course Outcome(CO)	Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy
CO1	Develop basic knowledge on importance, scope and potential of bio control agents.	Understand
CO2	Ability to distinguish the types of bio control agents..	Analyse
CO3	Have a detailed awareness on advantages of bio control agents on chemical agents.	Comparison
CO4	Learner will be able to produce bio control agents..	Understand



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

11. MAPPING OF COs WITH PSO_s AND PO_s

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	0	1	0	1	1	1	1	1	2	2	0	1	1	1	0	1	0
CO2	1	0	2	1	0	1	1	1	2	2	1	2	1	1	2	1	1
CO3	1	1	2	1	1	1	1	1	2	0	1	2	1	1	1	1	1
CO4	1	0	2	1	1	0	1	1	2	1	1	2	1	1	2	1	1
AVG	0.8	0.5	1.5	1.0	0.8	0.8	1.0	1.0	2.0	1.3	0.8	1.8	1.0	1.0	1.3	1.0	0.8

12. MODULE-WISE COURSE CONTENTS

MODULE 1: BIO CONTROL AGENTS AND THEIR IMPORTANCE

MODULE DURATION: 15 Hrs. [Contact Hrs. 6 Hrs. Lab Hours: 2 Course Works: 3 and Assessment Works: 4]

MODULE CONTENT: Strategies of bio control agents - Classical, augmentation, conservation. Classification of bio control agents. Microbes - Parasitoids, predators. Microbes-Bacteria, Fungi, Viruses.

MODULE OUTCOME: On successful completion of the module learners can familiarise with the strategies of bio control agents and the detailed study about the beneficial microorganisms.

MODULE 2: DISEASE MANAGEMENT

MODULE DURATION: 15 Hrs.[Contact Hrs. 2 Hrs., Lab Hours: 6. Course Works: 4 and Assessment Works: 3]



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

MODULE CONTENT: Disease management-*Trichoderma viride*, *Pseudomonas fluorescens*. production, mode of action and application. Merits and demerits of bio control agents and their applications.

MODULE OUTCOME: On successful completion of the module learners will be able to understand the bacterial bio control agents and their productions.

REFERENCES:

1. *Microbial Ecology*, John Wiley & Sons, Inc, New York.
2. Rangaswami G., Bagyaraj D. J., *Agricultural Microbiology*, 2nd edition, Prentice Hall of India.

ADDITIONAL REFERENCES & STUDY MATERIALS:

3. Singh R. S. (1998). *Plant Diseases Management*. 7th edition. Oxford & IBH, New Delhi.

13. DELIVERY MODE

The course employs multi-mode delivery mechanisms including contact lecture, online MOOC courses from NPTEL, Online and offline course works.

14. DELIVERY SCHEDULE

June to September.

15. DETAILED COURSE DELIVERY PLAN

Hour	Delivery Mode and Activity	Topics to be Covered
1	Contact Hour - 1: Classroom Discussion	Introducing the Course
2	Lab Hour - 1	Basic identification techniques of microorganism



Manassery, Mulkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

Hour	Delivery Mode and Activity	Topics to be Covered
3	Contact Hour - 2: Classroom Demonstration	Bio control agents and their importance
4	Contact Hour - 3: Classroom Demonstration	Importance of bio control agents and their importance
5	Contact Hour - 4: Classroom Demonstration	Types of bio control agents and their effects
6	Contact Hour - 5: Classroom Demonstration	Classical, Augmentation, conservation methods of bio control agents
7	Contact Hour - 6: Classroom Demonstration	Introducing parasitoids and predators
8	Lab Hour - 2	Introducing and preparation process of bio control agents
9	Course Work – 1: Course Assignment	Course Assignment to write notes on use of bio control agents
10	Course Work – 2: Course Assignment	Course Assignment to study of bacterial and fungal bio control agents
11	Assessment Hour - 1	Assignment to ensure beneficial microorganism
12	Course Work – 3: Course Assignment	Course Assignment to strategies of bio control agents
13	Assessment Hour - 2	Assignment to various classification of bio control agents
14	Contact Hour - 7: Classroom Demonstration	Cultivation of organisms from various samples
15	Contact Hour - 8: Classroom Demonstration	Discussing the characters identification methods



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

Hour	Delivery Mode and Activity	Topics to be Covered
16	Lab Hour - 3	Observing through microscope to find the structure of bacteria
17	Lab Hour - 4	Staining techniques to identify the organism.
18	Lab Hour - 5	Biochemical identification of organism
19	Course Work – 4: Course Assignment	Course Assignment to make notes on antagonistic activities
20	Course Work – 5: Course Assignment	Course Assignment to make note on merits and demerits of bio control agents
21	Lab Hour - 6	Observing the effects of bio control agents
22	Lab Hour - 7	Cultivation of bio control agents
23	Lab Hour - 8	Identify bacterial and fungal bio control agents
24	Assessment Hour - 3	Assignment to Create important functions of bio control agents
25	Assessment Hour - 4	Assignment to make notes on different types of fungus and spore
26	Assessment Hour - 4	Assignment to make notes on different types of fungus and spore
27	Course Work – 6: Course Assignment	Course Assignment to make note on different bacterial bio control agents
28	Course Work – 7: Course Assignment	Course Assignment to make cultural properties of bio control agents
29	Assessment Hour - 5	Course End Assessment
30	Assessment Hour - 6	Course End Assessment



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121



www.mamocollege.org

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

16. ASSESSMENT COMPONENTS

Total Marks: 100

CLASSROOM AND GROUP PARTICIPATION: 20 Marks. This component aims at testing the course content understanding and the reflection skills and their attainment levels.

COURSE WORK: 30 Marks. This component aims at testing the skill attainment levels of the learners in analysing and implementing the real-world problem.

MID-COURSE ASSIGNMENT: 20 Marks. This component aims at testing the module-wise attainment levels of the course objectives and course outcome and module outcomes.

END-COURSE ASSESSMENT: 30 Marks. This component aims at testing overall attainment levels of the course with respect to course objectives, course outcome and module outcomes.

17. COURSE EVALUATION & GRADING

The course evaluation is done/coordinated entirely by the course coordinator. The following 10-point Indirect Grading System is used for awarding grades to students:

Percentage of Mark	Letter Grade	Interpretation	Class
95 and above	O	Outstanding	First Class with Distinction
85 to below 95	A+	Excellent	First Class with Distinction
75 to below 85	A	Very good	First Class with Distinction
65 to below 75	B+	Good	First Class
55 to below 65	B	Satisfactory	First Class
45 to below 55	C	Average	Second Class



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org



MUHAMMED ABDURAHIMAN MEMORIAL ORPHANAGE (MAMO) COLLEGE

[Govt. Aided First Grade College & Affiliated to University of Calicut.
Re-Accredited by NAAC with A Grade]

DEPARTMENT OF MICROBIOLOGY

CURRICULUM FOR CERTIFICATE COURSE - CERMB005

35 to below 45	P	Pass	Third Class
Below 35	F	Failure	Fail
Incomplete	I	Incomplete	Fail
Absent	Ab	Absent	Fail

The grade is awarded by the course-coordinator by considering the overall performance of the learner in all the assessment component of the course.

18. GRIEVANCE REDRESSAL

The grievances, if any, can be submitted to the Head of the Department for its redressal. Those grievances that cannot be redressed by HoD can be forwarded to Academic Council of the College for final decision on the matter.

19. ISSUANCE OF CERTIFICATES

The Course Completion Certificate will be issued to all the successful candidates showing the Total Marks and Grade Obtained.



Manassery, Mukkam Post,
Kozhikode, Kerala, India, 673 602.
email: mamocollege@gmail.com



Office: 0495-2297319
Principal: 0495-2295121

COORDINATOR
ACADEMIC COMMITTEE
MUHAMMED ABDURAHIMAN MEMORIAL
ORPHANAGE COLLEGE
P.O. MANASSERY, MUKKAM - 673602



www.mamocollege.org