



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** **CERMB002: MICROSCOPY**

OFFERED DURING THE
ACADEMIC YEAR 2017-18
[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 - CERMB002

| 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: PSO _s | 7 |
| 5. | B.Sc MICROBIOLOGY: PO _s | 9 |
| 6. | CERMB002: 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 | 14 |
| 6.8. | COURSE OBJECTIVES | 14 |
| 6.9. | SKILL EXPECTED | 14 |
| 6.10. | COURSE OUTCOMES | 14 |
| 6.11. | MAPPING OF CO _s WITH PO _s AND PSO _s | 15 |
| 6.12. | MODULE-WISE COURSE CONTENTS | 15 |
| 6.13. | DELIVERY MODE | 17 |
| 6.14. | DELIVERY SCHEDULE | 17 |
| 6.15. | DETAILED COURSE DELIVERY PLAN | 17 |
| 6.16. | ASSESSMENT COMPONENTS | 19 |
| 6.17. | COURSE EVALUATION & GRADING | 20 |
| 6.18. | GRIEVANCE REDRESSAL | 21 |
| 6.19. | ISSUANCE OF CERTIFICATES | 21 |



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 - CERMB002

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 - CERMB002

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 - CERMB002

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 - CERMB002



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 - CERMB002

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 - CERMB002



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



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 - CERMB002

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 - CERMB002



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



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



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 - CERMB002

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 - CERMB002

CERTIFICATE COURSE

CERMB002: MICROSCOPY 06

COURSE CURRICULUM

| | |
|-------------------------|----------------------|
| Course Name | Microscopy |
| Course Code | CERMB002 |
| Year | 2017-18 |
| Course Designer | Mrs. Sana M A |
| Course Duration | 30 Hrs |
| Course Schedule | November to February |
| 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 - CERMB002

1. COURSE LEVEL

Technical knowledge enhancing certificate programme.

2. PREREQUISITE

Knowledge in Basic Science.

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. Sana M. A, Assistant Professor, Department of Microbiology.

5. COURSE PREAMBLE

Microscopy has become one of the most useful tools in life science. This free online comprehensive series begins with basics of microscopy, proceeds through various types of microscopy, covers the various method soft imaging samples and concludes with some of the latest advances in microscopy. In addition to lectures, we also provide lab so as to cover pragmatics of how to use microscope. Assessments are provided for each lecture.

6. DURATION

Total Duration: 30 Hrs. [Contact Hrs. 12 Hrs, Course Woks: 12 and Assessment Works: 6]



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 - CERMB002

7. CURRICULUM FOCUS

Enhance the employability of the learners through curriculum enrichment for additional skill development.

8. COURSE OBJECTIVES

Learners are expected to

- The thorough theoretical and practical knowledge about microscopy .
- Enhance students microscopic skills

9. SKILL EXPECTED

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

- Acquire the knowledge of dealing with microscopes and its practical work.
- Increase their self-confidence to work in the field of laboratory and research areas

10. COURSE OUTCOMES

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

| CO No | Course Outcome(CO) | Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy |
|-------|---|--|
| CO1 | Identify and understand the principle components of microscope. | Understand |
| CO2 | Understand online , the principles of optics that appl to microscopy. | Understand |
| CO3 | Set up and use of a microscope. | Analyze |



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 - CERMB002

| CO No | Course Outcome(CO) | Skill/Knowledge Attainment Level Based on Revised Bloom's Taxonomy |
|-------|--|--|
| CO4 | Understand different types of microscope. | Understand |
| CO5 | Understand the structure of cell and tissue. | Understand |

11. MAPPING OF COs WITH PSO_s AND PO_s

| CO _s | 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 | 1 |
| CO2 | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 3 | 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 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| CO5 | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 2 | 3 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| AVG | 0.8 | 0.4 | 1.6 | 1 | 0.8 | 0.6 | 1 | 1 | 2 | 2.2 | 0.8 | 1.8 | 1 | 1 | 1.4 | 1 | 1 |

12. MODULE-WISE COURSE CONTENTS

MODULE 1: INTRODUCTION TO MICROSCOPE

MODULE DURATION: 10 Hrs. [Contact Hrs. 2 Hrs. Course Works: 4 and Assessment Works: 4]

MODULE CONTENT: Parts of microscopy, Resolution, Numerical aperture, Refraction index.



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 - CERMB002

MODULE OUTCOME: On completion of this module learners can function with the major parts of microscopy and they are introduced to the technical teams regarding microscopy and optics, types and usage.

MODULE 2: TYPES OF MICROSCOPY AND ITS USAGE

MODULE DURATION: 10Hrs. [Contact Hrs. 3 Hrs. Course Works: 4 and Assessment Works: 3]

MODULE CONTENT: It includes the knowledge on light microscopy, dark field microscopy, electron microscopy, fluorescent microscopy, phase contrast microscopy and their usage in laboratory and practical sessions.

MODULE OUTCOME: After completion of this module, they will be able to operate different types of microscope and practical knowledge along with their theoretical knowledge. It helped them to enhance their practical skills and their confidence in the field of research.

MODULE 3: INTRODUCTION OF STAINING TECHNIQUES

MODULE DURATION: 10Hrs. [Contact Hrs. 3 Hrs. Course Works: 4 and Assessment Works: 3]

MODULE CONTENT: Simple, negative, Grams, Spore, Flagella, acid fast, capsule staining methods.

MODULE OUTCOME: On successful completion of the module, learners will be able to study and compare structure of bacteria.

REFERENCES:

1. Prof. C Baveja, *Textbook of Microbiology*, Arya publications.
2. Jacquilyn G Black, *Microbiology: Principles and Explorations*.
3. Hans G. Schledge, *General Microbiology*, 7th edition.



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 - CERMB002

ADDITIONAL REFERENCES & STUDY MATERIALS

4. <https://nptel.ac.in/content/storage2/courses/102103044/pdf/mod3.pdf>
5. <https://nptel.ac.in/courses/102/107/102107028/>

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

November to February.

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 structure of microscope and its parts. |
| 3 | Contact Hour - 2: Classroom Demonstration | Different types of microscope. |
| 4 | Contact Hour - 3: Classroom Demonstration | Basic principles of microscopy like numerical aperture ,refractive index etc. |
| 5 | Contact Hour - 4: Classroom Demonstration | Principle and working of various microscopes. |
| 6 | Contact Hour - 5: Classroom Demonstration | Operation of compound microscope and light microscope in detail. |
| 7 | Contact Hour - 6: Classroom Demonstration | Introducing staining techniques. |



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 - CERMB002

| Hour | Delivery Mode and Activity | Topics to be Covered |
|------|---|--|
| 8 | Lab Hour - 2 | Introducing light and compound microscope. |
| 9 | Course Work – 1: Course Assignment | Course assignment to write notes on uses of microscopy . |
| 10 | Course Work – 2: Course Assignment | Course Assignment to study about the basic principle of working of microscope. |
| 11 | Assessment Hour - 1 | Assessment to ensure the basics in microscopy. |
| 12 | Course Work – 3: Course Assignment | Course Assignment to principle and working of microscopy. |
| 13 | Assessment Hour - 2 | Assignment to make detail notes on defferent types of stains. |
| 14 | Contact Hour - 7: Classroom Demonstration | Observing through microscope to find the structure of bacteria . |
| 15 | Contact Hour - 8: Classroom Demonstration | Demonstrations on gram ,spore ,simple, negative ,acid fast ,capsule staining . |
| 16 | Lab Hour - 3 | Differentiating bacteria according to cell structure . |
| 17 | Lab Hour - 4 | Observing capsulated bacteria. |
| 18 | Lab Hour - 5 | Differentiating motile and nonmotile bacteria. |
| 19 | Course Work – 4: Course Assignment | Course Assignment to make notes on defferent methods of staining techniques. |
| 20 | Course Work – 5: Course Assignment | Course Assignment to make notes on endospore staining. |



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 - CERMB002

| Hour | Delivery Mode and Activity | Topics to be Covered |
|------|------------------------------------|---|
| 21 | Lab Hour - 6 | Observing endospores, exospores of bacillus species. |
| 22 | Lab Hour - 7 | Fungal staining procedure (LPCB method). |
| 23 | Lab Hour - 8 | Observing <i>Rhizopus</i> , <i>Aspergillus</i> and <i>Penicillium</i> through LPCB staining method. |
| 24 | Assessment Hour - 3 | Assignment to make notes on fungal staining method. |
| 25 | Assessment Hour - 4 | Assignment to make notes on different types of fungus and spores. |
| 26 | Assessment Hour - 4 | Assignment to make notes on different types of fungus and spores. |
| 27 | Course Work – 6: Course Assignment | Course Assignment to make notes on hanging drop method to observe motility. |
| 28 | Course Work – 7: Course Assignment | Course Assignment to make notes on semi-solid agar method to observe motility of bacteria. |
| 29 | Assessment Hour - 5 | Course End Assessment |
| 30 | Assessment Hour - 6 | Course End Assessment |

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.



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 - CERMB002

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



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 - CERMB002

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



www.mamocollege.org

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