YENEPOYA UNIVERSITY

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Deralakatte, Mangaluru -575018

REGULATIONS AND CURRICULUM GOVERNING POST GRADUATE PROGRAM

M.Sc. IN MEDICAL MICROBIOLOGY

(CURRICULUM - EFFECTIVE FROM 2010-11)

ATTESTED

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Ref: No. YU/REG/ACA/3-ACM/2009 31.10.2009

NOTIFICATION

Sub: Starting of M.Sc. in pre & para clinical departments

Ref: Resolution of the Academic Council at its 3rd meeting held on 31.10.2009 vide agenda - 3

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The Academic Council at its 3rd meeting and subsequently the Board of Management at its 9th meeting held on 31.10.2009 have resolved to approve the proposal to start following M.Sc. in pre & para clinical departments:-

1. M.Sc Medical Anatomy
2. M.Sc Medical Physiology
3. M.Sc Medical Biochemistry
4. M.Sc Medical Pharmacology
5. M.Sc Medical Microbiology

This notification is issued for implementation with effect from the academic year 2010-2011.

I/c REGISTRAR
Registrar
YENEPOYA
(Deemed to be University)

To:

The Principal - YMC

Copy to:

1. Controller of Examinations
2. File copy

MSc Medical Microbiology

Regulations governing the "Master of Science (Medical) degree program "(Applicable to 2012 batch onwards) of Yenepoya University.

Title of the programme: The programme shall be called Master of Science (medical) leading to the award of M.sc (medical) degree

Areas of specialty:
Medical Microbiology

Eligibility for admission to the programme: To be filled by the office of admission, YU
Duration of the programme: 3 years

Course of study:

The programme shall consist of two parts:
1. M.Sc.(Preliminary)-1 year duration
2. M.Sc (Specialty)-2 year duration

Course curriculum:

M.Sc. (preliminary): Consists of study of basic medical sciences, namely Anatomy, Physiology and Biochemistry. The curriculum is common to all the specialty subjects.

M.Sc (specialty):

CURRICULUM FOR M.SC MEDICAL MICROBIOLOGY

OBJECTIVES: The aim of this course is to train the students in the field of medical microbiology theoretical and practical training is given to the students in the subspecialties i.e., Bacteriology, Virology, Parasitology, Immunology and Mycology.

At the end of the course the students will be able to:

1. Carry out fundamental research in microbiology.
2. Establish good laboratory practice in hospitals and community.
3. Be eligible to join for doctoral degree eg. PhD Medical Microbiology in any of the sub specialties.
4. Undertake teaching in allied health institutions.

DURATION OF COURSE: 3 years

1st year the students have to be trained in basic medical sciences i.e. Anatomy, Physiology and Biochemistry.

The next two years they will be trained in the respective fields.

Syllabus for II & III rd year MSc Medical Microbiology

COURSE CONTENT

II YEAR

General Microbiology: 10 hrs

1. Historical Introduction
2. Microscopy
3. Morphology and Physiology of Bacteria and other organisms

4. Nomenclature and classification of microbes
5. Growth and nutrition of bacteria
6. Bacterial metabolism
7. Sterilisation and Disinfection
8. Bacterial toxins
9. Bacterial antagonism: Bacteriocins
10. Culture Media
11. Culture Methods
12. Identification of Bacteria
13. Bacterial Taxonomy
14. Bacterial Genetics

Immunology: **30 hrs**

1. Infections
2. Immunity
3. Antigens
4. Antibodies – Immunoglobulins
5. Antigen – Antibody Reactions
6. Complement System
7. Structure and Functions of the Immune System
8. Immune Response
9. Immunodeficiency Diseases
10. Hypersensitivity
11. Autoimmunity
12. Immunology of Transplantation and Malignancy
13. Immunohematology.

Systematic Bacteriology: **60hrs**

1. Staphylococcus
2. Streptococcus
3. Pneumococcus
4. Neisseria
5. Corynebacterium
6. Bacillus
7. Clostridium
8. Nonsporing anaerobes
9. Enterobacteriaceae – I Coliforms; Proteus
10. Enterobacteriaceae – II Shigella
11. Enterobacteriaceae – III Salmonella
12. Vibrio
13. Pseudomonas
14. Yersinia, Pasteurella, Francisella
15. Haemophilus
16. Bordetella
17. Brucella

18. Mycobacterium – I Tuberculosis
19. Mycobacterium – II Atypical Mycobacteria
20. Mycobacterium – III M. Leprae
21. Spirochetes
22. Mycoplasma
23. Actinomycetes
24. Miscellaneous Bacteria
25. Rickettsiaceae
26. Chlamydiae

III YEAR

Virology: **40 hrs**

1. General Properties of Viruses
2. Virus Host Interactions: Virus Infections
3. Bacteriophage
4. Poxviruses
5. Herpesviruse
6. Adenoviruses
7. Picornaviruses
8. Orthomyxovirus
9. Paramyxoviruses
10. Hepatitis Viruses
11. Miscellaneous Viruses – Slow virus infection, Pox viruses, Reo viruses And emerging, re-emerging viral diseases.
12. Oncogenic Virus
13. Human Immunodeficiency Virus: AIDS

Parasitology: **30 hrs**

1. Protozoans: i. Intestinal
   ii. Genital
   iii. Protozoans in blood
   iv. Opportunistic protozoans
2. Helminths: Cestodes: Taenia, Echinococcus, Hymenolepis and emerging
3. Nematodes: Intestinal, Tissue
4. Trematodes of medical importance.
5. Medical entomology with reference to vectors
6. Recent advances in emerging and re-emerging parasites.

Mycology: **20 hrs**

1. The morphology and reproduction in fungi and antimycotic agents
2. Classification of fungi
3. Contaminant and opportunistic fungi

4. Superficial mycotic infections
5. Fungi causing subcutaneous mycoses
6. Fungi causing systemic infections.

MISCELLANOUS: **10 hrs**

1. Normal Microbial flora of the Human Body
2. Bacteriology of Water, Milk and Air
3. Applied Microbiology
4. Laboratory Control of Antimicrobial therapy
5. Immunoprophylaxis
6. Hospital Infections & Biomedical waste management.

	TOPIC	No. of Teaching Hours
1	General Microbiology	10
2	Immunology	30
3	Systematic Bacteriology	60
4	Virology	40
5	Parasitology	30
6	Mycology	20
7	Miscellaneous	10
	Total	200

TERM	TOPIC DISTRIBUTIONS
III	General bacteriology, Immunology, Systematic Bacteriology
IV	Systematic Bacteriology, Parasitology
V	Virology, Mycology
VI	Applied Microbiology, Project submission

PRACTICALS:

SKILLS:

1. Do stool exam for ova and cysts; and hanging drop for Vibrio for Vibrio cholera.
2. Do and examine a wet film of vaginal smear for Trichomonas and fungus.
3. Perform and interpret Gram's stain and Ziehl-Neelsen or modified Ziehl Neelsen's stain.
4. Perform skin scraping and do a KOH preparation for fungal infection.
5. De cell counts and gram stain of CSF and other body fluids.
6. Interpret blood smear for parasites like malaria and filaria.
7. Interpret antimicrobial sensitivity reports.
8. Interpret serological tests such as VDRL, ASLO, WIDAL, HIV, Rheumatoid factor, hepatitis and TORCH infections, Treponema pallidum Haemagglutination, Haemagglutination in Virology, Haemagglutination inhibition.
9. Be able to process the following clinical samples for microbiological tests: Blood, pus, urine, CSF, body fluids, stool, sputum, throat swabs and serum.
10. Care, experiment and breeding of experimental animals used in Microbiology research.
11. Adopt universal precautions for self precaution against HIV and Hepatitis.

POSTINGS IN DIAGNOSTIC LABORATORY

Sl No	Section	Duration in months
1	Glass ware, Culture media, Staining, sterilization,	6
2	Bacteriology	8
3	Serology, Immunology	2
4	Mycology, Parasitology	2
5	Molecular Diagnostic Lab	2
	Total	20

METHODS OF TRAINING:

The training is given under the following headings:

1. Seminars
2. Culture seminars and serological tests
3. Journal clubs
4. Preparation of project under the guidance of a teacher.

MONITORING THE PROGRESS OF STUDIES:

1. Work diary, Log book
2. Periodic tests and viva voce
3. Records
4. Project Submission under the guidance of a teacher.

SCHEME OF UNIVERSITY EXAMINATION:

There shall be two examinations viz. preliminary examination and final examinations.

1. The preliminary examinations shall be taken at the end of Ist year.
2. The final examination shall be taken at the end of the III rd year.

1. Preliminary examination pattern (Common to all specialty subjects)

THEORY:

There shall be a separate paper in each of the three subjects, namely, Anatomy, Physiology and Biochemistry

PRACTICAL:

There will be no practical examinations for the preliminary examination

Marks distribution:

	Anatomy	Physiology	Biochemistry
Final examination (3 hour duration)	80 marks	80 marks	80 marks
Internal assessment	20 marks	20 marks	20 marks
Total	100 marks	100 marks	100 marks

2. Final examination pattern:

Eligibility for final examination: A minimum of average 40% marks in internal assessment is mandatory for appearing in the final university exam

A. Internal Assessment examination

	Portions	Total marks	Practicals and viva
I Internal exam	**General Microbiology and Immunology**	100 marks	100 marks
II Internal exam	**Systematic Bacteriology and**	100 marks	100 marks

	Mycology		
III Internal exam	**Virology and Parasitology**	100 marks	100 marks

B. Scheme of Final University examination

Maximum Marks	Theory (3 papers of 100 marks each)	Internal assessment theory	Practical	Internal assessment practical	Viva voce	Total
MSc Medical Microbiology	300	25	100	25	50	500

A. Theory

There shall be three questions papers, each of three hours duration. Each paper shall consist of two long easy questions each question carrying 20 marks and 6 short essay questions each carrying 10 marks. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers.

Details of distribution of topics for each paper will be as follows:

PAPER 1- General Microbiology and Immunology

PAPER2- Systematic Bacteriology and Mycology

PAPER3- Virology and Parasitology

The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

B. Practicals

Duration of examination: 3 days [as per the scheme enclosed]: Marks: 100

The examination will consists of the following exercises conjointly conducted and evaluated by four examiners [2 internals and 2 externals]

1. Exercise in clinical bacteriology
   Isolation and identification of bacteria from various clinical samples.
2. Exercise in bacteriological techniques
   Isolation and identification of bacteria from a pure culture
3. Identification of fungi, and slide culture
4. Exercise in virology techniques.
5. Exercise in Parasitology
6. Serology exercise.

C. **Viva voce** : Marks: 50

The viva voce examination consists of question on Bacteriology, Mycology, Virology, Immunology, and Parasitology topics; it will also include recent advances, history and scope of Microbiology.

Students will be examined by all the examiners (2 Internal + 2 External Examiners) together about comprehension, analytical approach, expression and interpretation of data. It includes discussion on project.

RECOMMENDED BOOKS [Recent Editions]

1. Ananthanarayan: [Ananthanarayan & Jayaram Paniker's] Textbook of Microbiology, Et. & Orient Longman Ltd., Chennai.
2. Jawetz [Melnick] et al. Medical Microbiology, ed. Z Appleton and Lange, USA
3. Zinsser [Joklik and Willett] et. Al. Microbiology, Appleton and Lange, USA
4. Chatterjee [KDC], Parasitology, Chatterjee Medical Publishers, Calcutta.
5. Paniker [C.K. Jayaram], Text book of Medical Parasitology, Jaypee, New Delhi
6. Bhatia and lchhpujani, Essential of Medical Microbiology, Jaypee, New Delhi
7. A text book of Microbiology by Chakraborthy, New Delhi.

REFERENCE BOOKS:

1. Green wood, Medical Microbiology, Ed-15, Churchill Livingstone.
2. Roitt [Ivan.M] Essential Immunology, Ed.6, ELBS, Hong Kong
3. MIMS [Cedric, Playfair] et al, pathogenesis of Infectious diseases, Academic Press, London
4. Rippon, Medical Mycology, Ed.2. W.B. Saunder's and Co.
5. KONEMAN [Allen and Janda et al], Diagnostic Microbiology, J.B.Lippincott Co.
6. BELLANTI, Immunology, ed.3, W.B.Saunder's and Company.
7. BALOWS, Manual of clinical Microbiology, ASM, Washington DC.
8. STITES [Terr and Parslow], Medical Immunology, Appleton and Lange USA
9. ROITT [Brostoff and Male] Immunology, Mosby, London
10. EMMONS [Bin ford] et al, Medical Mycology, K.M. Varghese Co., Bombay
11. MANSON – BARR [BELL], Manson's Tropical diseases, ELBS
12. BEAVER, [Jung and Corpp], Clinical Parasitology
13. TOPLEY and WILSON – Principles of Bacteriology, Virology, Immunity, Edward Arnold.
13. BERGEY'S manual, [Holt and Krieg] et al, Determinative bacteriology, Williams and Wilkins, Maryland, USA.
14. ROITT, Encyclopedia of Immunology, Academic Press Ltd., London
15. HOEPRICH, Infectious diseases, Harper and Rao Publishers, Philadelphia.
16. MANDELL [Donerglas Aan Bennett], Principles and practice of infectious diseases, Churchill Livingstone.
17. BAILEY AND SCOTT, Diagnostic Microbiology, Mosby Publishers
18. MACKIE AND MACCARTENY – Vol II [Collee & Duguid] et al, Churchill Livingstone.
19. Clinical Microbiology procedures Handbook, Henry D. et al. ASM
20. COWAN & STEEL [Barrow & Feltham], Manual for the identification of Medical bacteria, Cambridge university press.
21. STOKES [Ridgeway and Wren], Clinical Microbiology, Edward Arnold, London
22. Basic Laboratory Procedures in clinical bacteriology, WHO, Vandepitte et al, Jaypee
23. Basic Laboratory Procedures in Medical Parasitology, WHO, Vandepitte et al, Jaypee

Journals:

1. Journal of Medical Microbiology, Lippincott-Raven publishers, Pathological Society of Great Britain & Ireland
2. Microbiology and Molecular Biology Review [mmbr] Pub: American Society for Microbiology
3. The Journal of infectious Diseases, Pub: The University of Chicago Press
4. Indian Journal of Medical Microbiology, Pub: Indian Associates of Medical Microbiologists
5. The Indian Journal of Medical Research, Pub: Indian council of Medical research, New Delhi
6. Annual Review of Microbiology, Pub: Annual Reviews, Inc. Palo Alto. California, USA

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