

3. Text Book of Forensic medicine and Toxicology by Nagesh Kumar G.Rao, 2nd Edition. Jaypee brothers Medical Publishers
4. Principles and practice of Forensic medicine. Dr. B. Umadethan 2008, Swami Law Publishers.
5. Parikhs Text Book of Medical Jurisprudence, forensic medicine and Toxicology, 6th edition, CBS Publishers and Distributors.
- 7 J.B. Mukherjee's forensic medicine and Toxicology. R.N. Karmakar 2007.

### Evaluation

Internal assessment examinations may be conducted as per the discretion. examination per semester, without violating MCI norms. : Minimum one

<b>Theory</b>	<b>40</b>
Internal assessment	10
Viva	10
Total	60
<b>Practicals</b>	<b>30</b>
Intrenal Assessment	10
Total	40
<b>Grand Total</b>	<b>100</b>

### Topics and mark allotment

Medical jurisprudence (Ethics to be given due importance)	20%
Court and legal procedures	10%
Thanatology, M/L autopsy	8%
Asphyxial deaths	10%
Traumatology	10%
Sexual jurisprudence	20%
Infanticide	10%
Trace evidences	5%
Forensic psychiatry	2%
Toxicology	5%

## MICROBIOLOGY

### A. GOAL

The broad goal of the teaching of undergraduate students in Microbiology is to provide an understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections in the

community.

## **B.OBJECTIVES**

### **1. Knowledge**

At the end of the course, the student shall be able to

- i. State the infective microorganisms of the human body and describe the host parasite relationship
- ii. List pathogenic microorganisms (bacteria, viruses, parasites, fungi) and describe the pathogenesis of the diseases produced by them
- iii. State or indicate the mode of transmission of pathogenic and opportunistic organisms and their sources including insect vectors responsible for transmission of infection
- iv. Describe mechanisms of immunity to infections
- v. Acquire knowledge on suitable antimicrobial agents for treatment of infections and scope for immunotherapy and different vaccines available for prevention of communicable diseases
- vi Antibiotic policy/stewardship
- vii.National control programs for infectious diseases. Eg. RNTCP, Malaria control program,STDs, NACO, Immunisation program.
- viii Apply methods of disinfection and sterilization to control and prevent hospital and community acquired infections
- vii. Recommend laboratory investigations regarding bacteriological examination of food, water, milk and air.

### **2. Skills**

At the end of the course the student shall be able to

1. Plan and interpret laboratory investigations for the diagnosis of infectious diseases and to correlate the clinical manifestations with the etiological agent
2. Identify the common infectious agents with the help of laboratory tests and determine the efficacy of antimicrobial agents against them.
3. Perform commonly employed bedside tests for detection of infectious agents such as blood film for malaria, filaria, gram staining, Acid Fast Bacilli (AFB) staining and stool sample of ova cyst etc.
4. Use the correct method for collection, storage, and transport of clinical specimens for microbiological investigations.
5. .To learn to use the principles of evidence based discision making of microbiological tests.

### **3. Integration**

The student shall understand infectious diseases of national importance in relation to

clinical, therapeutic and preventive aspects

### C. DETAILED SYLLABUS

**Duration of the course: 3 semesters-III, IV, V Total Number of Hours: 250 Lectures: 80**

**Practicals: 80 Innovative sessions: 90 (Project work, Seminars, Structures discussions, Integrated teaching, Formative evaluation, revision)**

(The teaching should stress on Pathogenesis, Laboratory diagnosis, sterilization and disinfection, infectious diseases common in Kerala and India, Hospital infection, antibiotic use, Principles of immune prophylaxis and immunotherapy and applied and clinical microbiology. Basic morphology and life cycle of parasites required for lab diagnosis. Certain portions to be deleted—Detailed morphological, cultural, Biochemistry, and Antigenic characters,)

#### DETAILS OF LECTURES

80hrs

##### I. General microbiology

12hrs

- Introduction to microbiology
- Morphology of bacteria comparison with other microbial forms
- Growth, nutrition culture media
- Identification of bacteria
- Bacterial genetics
- Antibacterial agents and antibiotic sensitivity test
- Infection-Source and spread of infection
- Sterilisation and disinfection
- Response to microbial infections

##### II. Systematic bacteriology

25 hrs

1. Gram positive Cocci-Staphylococci, Streptococci, Pneumococci
2. Gram negative Cocci-Neisseria
3. Gram Positive Bacilli-Corynebacterium, Listeria, Bacillus
4. Mycobacteria, Nocardia, Actinomyces
5. Clostridia, Nonsporing anaerobes.
6. Gram negative Bacillus-Haemophilus, Bordetella, Brucella, Enterobacteria/Yersinia
7. Pseudomonas, Pasteurella, Acinetobacter
8. Vibrio/Campylobacter
9. Mycoplasma, Legionella, Rickettsia, Chlamydia
10. Spirochetes

##### III. Virology

15 hrs

1. General characteristics of viruses.
2. Virus host interaction

3. Replication of virus
4. Pox virus, Herpes, Adenovirus
5. Papova, Retrovirus
6. Myxoviruses
7. Picorna virus
8. Hepatitis, Miscellaneous
9. Rhabdo virus
10. Arboviruses
11. Oncogenic viruses
12. HIV
13. Bacteriophages

**IV. Immunology**

12hrs

1. Introduction Classification, type and cells involved in immunity
2. Antigen, Antibodies
3. Complement in health and diseases
4. Hypersensitivity
5. HLA antigens in health and diseases
6. Immunodeficiency diseases
7. Serological test in medical practice
8. Auto immunity
9. Tumour and transplantation immunology
10. Immunoprophylaxis and immunotherapy
11. Immunohaematology

**V. Parasitology (Topic presentation)**

12 hrs

1. Introduction of parasitic disease
2. Protozoal infections-Amoebiasis, Plasmodium, Leishmaniasis, Trypanosoma,

Giardia, Balantidium, Cryptosporidium, Trichomonas, Toxoplasma,

Pneumocystis-laboratory diagnosis of protozoal infection

3. Helminthus-intestinal nematodes, tissue nematodes, cestodes, trematodes-

Laboratory diagnosis of helminthic infections

**VI. Mycology**

4 hrs

1. Introduction-Classification of fungi and general principles of lab diagnosis
2. Superficial infections
3. Subcutaneous infections-Mycetoma, Rhinosporidiosis

<b>DETAILS OF PRACTICALS AND DEMONSTRATION</b>		40 hrs
1. Techniques Simple stain, Gram Stain, Ziehl –Neelsen stain,		
Fungus Lactophenol cotton blue,		
Parasitology stool examination		
2. Clinical microbiology (Demonstration cum practical)		60hrs
a.	Oropharyngeal infection	
b.	Wound infection	
c.	Respiratory tract infections	
d.	Meningitis	
e.	Gastro intestinal infections	
f.	Urinary tract infections	
g.	Urethritis	
h.	Blood culture techniques	
i.	Equipments/Instruments	
j.	Interpretation of lab results	
k.	Infection control measures	
l.	Community outbreak investigation and control measures	
m.	Antibiotic stewardship and antibiotic policy	

**APPLIED MICROBIOLOGY (Discussion and Integrated teaching)**

60hrs

1. Upper respiratory tract infections, infections of eye and ear
2. Pneumonia, Tuberculosis, Bronchitis-Aetiology, lab diagnosis, Prophylaxis
3. Rheumatic fever-Endocarditis, Myocarditis
4. Urinary tract infections
5. Enteric fever-P.U.O
6. Gastroenteritis-Cholera, other causes
7. Osteomyelitis-Arthritis, TB of bone
8. Meningitis, Pyogenic, Aseptic
9. Opportunistic infections
10. Sexually transmitted diseases
11. Hospital infection
12. Antimicrobial agents

**TUTORIAL**

10hrs

1. Normal flora
2. Anaerobic infections
3. Collection, transportation and preliminary processing of specimens
4. Laboratory diagnosis of viral infections
5. Investigations of epidemics in the hospital and community

**TEXTBOOKS RECOMMENDED**

**Prescribed Books**

1. Textbook of Microbiology by R. Anantha Narayanan and C.K.J. Paniker 7th Edition Orient Longman
2. A guide to Microbial Infections, Pathogenesis, Immunology, Laboratory diagnosis and Control by Greenwood. Slack and Penthera
3. Essentials of Medical Microbiology, Apurba Sankar Sastry, Sandhya Bhatt.K
4. Textbook of Microbiology and Immunology, Subash Chandra Parija
5. Textbook of Parasitology by C. K. J. Paniker / Chakraborty / Pareja
6. Textbook of Parasitology by Chatterjee.

**Reference Books**

1. Medical Microbiology by Jawetz E, Melnick J L, Adelberg E A
2. Textbook of Immunology, Kuby

**EVALUATION:** There should be regular formative assessment

**Internal assessment :** The internal assessment marks for Microbiology are 15 for Practical and 15 for Theory. Since the minimum required for appearing for University exam is 35% the total minimum marks required for internal assessment would be 5.5 out of 15, There need to be a separate minimum for Practical and Theory internal assessment.

The total marks for Microbiology is 150 (Theory 80 (2 papers) + Viva 15 + Practical 25 + internal assessment 30).

The pass has to be decided as follows:

1. A candidate must obtain minimum 50% marks separately for University theory examination
2. A candidate must obtain minimum 50% marks separately for University practical examination
3. Total aggregate marks should be 75 out of 150 marks or more for pass.
4. Theory and Practical Internal assessment marks should be added to the marks obtained in Theory and Practical University exams respectively for deciding the pass
5. For Theory (80 + 15 viva + 15 marks internal assessment = 110) the minimum for pass should be 55 marks.
6. For Practical (25 + 15 marks internal assessment = 40) the minimum for pass should be 20 marks

**Microbiology-Two papers of 2 hour duration of 40 marks each**

**Microbiology paper I-General bacteriology, Immunology, & systematic bacteriology.**

Structured Essay =	10 marks
Short Essays (2 X5) =	10 marks

Short answer questions (10 X2) = 20 marks

**Total = 40 marks**

**Microbiology Paper II – Virology, Parasitology, Mycology, Clinical Microbiology**

Structured Essay = 10 marks

Short Essays (2 X5) = 10 marks

Short answer questions (10 X2) = 20 marks

**Total = 40 marks**

**Total marks (40 + 40) = 80 marks**

Internal assessment = 15 marks

Viva voce = 15 marks

**Total for theory = 110 marks**

(Duplication of the questions should be avoided)

Practicals

Internal assessment -15 marks. University –25 marks

University Practical -Exercises

1. Gram staining (Clinical material) – 5marks

2. AFB staining (Clinical Material) – 5 marks

3. Applied microbiology – 5 marks

4. Spotters-10 numbers – 10 marks (preferably OSPE)

2 minutes for each spotter, 2-4 sub questions with each spotter.

(2 Mycology, 3 Parasitology, 2 General Bacteriology, 2 Virology/Immunology & 1 Clinical Bacteriology)

**PATHOLOGY**

**GOALS**

The broad goal of teaching undergraduates Pathology is to impart the knowledge skills and attitudes in the learner to understand the etiopathogenesis, morphology and pathological concepts related to various common diseases.

**Learning Objectives**

At the end of the course, the learner shall be able to:

1. Know the principles of collection, handling, storage and dispatch of clinical samples from patient, in a proper manner.
2. Perform and interpret in a proper manner the basic clinico-pathological procedures.
3. Have an understanding of the common hematological disorders and the investigations necessary to diagnose them and determine their prognosis.
4. Understand the concept of cell injury, the change produced thereby, in different tissues and organs and the body capacity for healing.