

Module Coordinator : Head Microbiology/ Head Parasitology or an appointed staff member from Department of Microbiology or Parasitology.

**Resource pool****Department of Microbiology**

Dr. C. Gamage (Head/Microbiology)

Prof F. Noordeen

Dr N. Dissanayake

Dr V. Liyanapathirana

Dr. C. Ratnatunga

Dr. A. Tennegedara

**Department of Parasitology**

Prof D. Iddawella (Head/Parasitology)

Dr R. Morel

Prof S. Wickramasingha

Dr D. Attapattu

**Department of Biochemistry**

Prof. Kalana Maduwage

**No. of credits 4**

Component	Lectures	SGDs	Practicals	Seminar	Assignment
General	8	1	4	2	
Bacteriology	13	3	1.5		
Virology	10	3	1.5		
Mycology	2				
Combined Microbiology		2			
Parasitology	15	3	5.5		
Total	48	12			
Credit equivalents					

**Hours of credit equivalence = 60 lecture h**

Total Lectures } 60  
 SGD }

Seminars 2 h

Practical's Per student 12.5 h

Total time tabled hours 121

Total credit hours 67.25

<b>Topic</b>	<b>Time</b>	<b>Objectives</b>	<b>Dept</b>	<b>Resp/person</b>	<b>Teaching/ Learning activity</b>
<b>1. Overview of microbiology in relation to human health</b>	1 h	<ol style="list-style-type: none"> <li>1. Explain the interactions of microorganisms in relation to human beings</li> <li>2. State why medical undergraduates need to know about micro organisms</li> <li>3. Describe what medical microbiologists and parasitologists do</li> </ol>	Micro	Module coordinator	Lecture
<b>2. Proving causation of infection, causality - Koch's postulates and its limitations</b> <b>3. Microbial classification and visualization</b>	1h	<ol style="list-style-type: none"> <li>1. Discuss how causation of infections can be proved by being able to state and explain Koch's postulates and its limitations</li> <li>2. Describe the basis of microbial classification</li> <li>3. Describe the basic structure of bacteria, fungi and viruses</li> <li>4. State the methods by which microorganisms can be visualized and identified Outline how these methods could be used to diagnose infective diseases</li> </ol>	Micro	Module coordinator	Lecture
<b>2. Introduction to Medical Parasitology and classification of parasites</b>	1 h	<ol style="list-style-type: none"> <li>1. List the characteristics of different groups of protozoa, helminths (nematodes, cestodes, trematodes) and arthropods</li> </ol>	Parasit	Module coordinator	Lecture
<b>6. Microscopy</b>	1.5 h x 4 groups	<ol style="list-style-type: none"> <li>1. Identify the parts of a compound light microscope</li> <li>2. Perform light microscopy following a standard operating procedure and properly use the compound light microscope</li> </ol>	Micro and Parasit	Module coordinator	Practical

		3. Name the different types of microscopes available and their specific uses			
7. <b>Microbial growth, dissemination and survival within and outside the human host</b> 8. <b>Host-parasite relationship</b>	1 h	1. Describe the dynamics of growth in different types of micro organisms 2. List the different ways in which microorganisms survive for long periods within and outside the human host 3. Describe the relationships of microorganisms to the human host (contamination, colonization and infection) 4. List the difference between communicable and non-communicable infections and exogenous and endogenous infections	Micro	Module coordinator	Lecture
9. <b>Inter-relationships among parasites, hosts and vectors</b>	1 h	1. Define the following terms; parasite, host, endoparasite, ectoparasite, pathogen, commensal, obligatory parasite, facultative parasite, definitive host, intermediate host, reservoir host, and vectors (mechanical and biological) 2. Describe the growth, survival and spread of protozoan and helminth parasites within and outside the human host	Parasit	Module coordinator	Lecture
10. <b>The process by which organisms cause disease to host tissue</b>	1 h	1. Define the term pathogenesis, 2. List the currently known modes of transmission – microbial entry 3. Describe the essential steps in the establishment of microbial infections – e.g attachment, colonization, invasion, tissue damage	Micro	Module coordinator	Lecture

		4. Explain how common clinical manifestations of infections reflect these mechanisms of damage in various organs			
<b>11. Methods of preventing infections to include sterilization and disinfection</b>	1 h	1. Define the terms sterilization, disinfection, anti-septic and disinfectant. 2. Evaluate the principles underlying prevention of infections and ill health due to micro organisms and parasites	Micro	Module coordinator	Lecture
	1 h x 8 groups	3. Perform hand hygiene, with knowledge of underlying principles, by different methods	Micro	Module coordinator	Practical
<b>Topics 1 – 10</b>	1 h	Objectives of topics 1 - 10	Micro and Parasit	Module coordinator	SGD
<b>Topics 1 – 10</b>	3h + 2 facilitator meetings	Objectives of topics 1 - 10	Micro and Parasit	Module coordinator	Seminar and 2 meetings
<b>Introducing medically important Bacteria</b>					

12. Introduction to bacteria including concepts in diagnosing bacterial infections	1h + 1.5 hr x 4 groups	1. List the methods available to diagnose bacterial infections a) Visualization b) Culture c) Antigen detection d) Antibody detection e) Detection of nucleic acid detection  2. Explain briefly the advantages and disadvantages of the given methods  3. Discuss the how the methods mentioned in objective 1 can be used to diagnose common bacterial infections	Micro	Module coordinator	Lecture + Practical
13. Staphylococci	1 h	1. Describe the medically important bacteria and their major morphological and biological characteristics that determine visualization/ identification in the laboratory  2. Describe the habitat, main mode(s) of transmission, morphology and growth characteristics in relation to identification, key virulence factors, pathogenicity and basis of clinical disease,  3. Discuss the principles of laboratory diagnosis and prevention of bacterial infections  4. Describe the principles of treatment of bacterial infections	Micro	Module coordinator	Lecture
14. Streptococci and Enterococci –	1h		Micro	Module coordinator	Lecture
15. Gram negative cocci to include <i>Neisseria</i> and <i>Moraxella</i>	1 h		Micro	Module coordinator	Lecture
16. Gram positive bacilli to include <i>Corynebacteria</i> , <i>Bacillus</i> , <i>Nocardia</i> and <i>Listeria</i>	1 h		Micro	Module coordinator	Lecture
17. Mycobacteria	1 h		Micro	Module coordinator	Lecture
18. Anaerobes including <i>Clostridia</i> , <i>Actinomycetes</i> and <i>Prevotella</i>	1 h		Micro	Module coordinator	Lecture

19. Gram negative bacilli to include enterobacteriaceae , pseudomonads and other NLF of clinical importance including Acinetobacter	2 h		Micro	Module coordinator	Lecture
20. Gram negative coccus bacilli to include <i>Haemophilus</i> , <i>Bordetella</i> , <i>Legionella</i> and <i>Pasteurella</i>	1 h		Micro	Module coordinator	Lecture
21. <i>Vibrio</i> , <i>Campylobacter</i> and <i>Helicobacter</i>	1 h		Micro	Module coordinator	Lecture
22. Spirochaetes	1 h		Micro	Module coordinator	Lecture
23. <i>Chlamydia</i> , Rickettsioses and <i>Mycoplasma</i>	1 h		Micro	Module coordinator	Lecture
24. Correct use of microscope, observation of smears and documentation of findings	1 h x 4 groups	1. Perform light microscopy following a standard operating procedure 2. To identify Gram positive and negative bacteria	Micro	Module coordinator	Practical
<del>25. Molecular diagnostic methods</del>	<del>1h x 8 groups + 1h lecture</del>		<del>Micro</del>	<del>Module coordinator</del>	<del>Practical + Lecture</del>
<b>Introducing medically important viruses</b>					
26. Introduction to virology	1 h	1. Describe the general properties and classification of viruses	Micro	Module coordinator	Lecture
27. Viruses causing Hepatitis	1 h	2. Explain the process of viral replication	Micro	Module coordinator	Lecture
28. Pox/ adeno/ parvo/	1 h	3. Describe mechanisms by which viruses cause disease in humans	Micro	Module	Lecture

papova viruses		4. State the main host defense mechanisms against viruses 5. Explain the main clinical features of viral infections/disease in humans 6. Evaluate the principles of laboratory diagnosis and prevention of viral infections 7. Describe the principles of treatment of viral infections		coordinator	
29. Herpes viruses	1 h		Micro	Module coordinator	Lecture
30. Respiratory viruses	1 h		Micro	Module coordinator	Lecture
31. Enteroviruses and Viruses causing gastroenteritis	1 h		Micro	Module coordinator	Lecture /SGD (article)
32. Arbo viruses	1 h		Micro	Module coordinator	Lecture
33. Retro viruses/ oncogenic viruses/ prions	1 h		Micro	Module coordinator	Lecture
34. Viruses of zoonotic importance to include rabies	1 h		Micro	Module coordinator	Lecture
35. Diagnostics in viral infections	1 h 1.5 h x 4 groups	1. Discuss the different methods used in the laboratory diagnosis of common viral infections a) Visualization b) Antigen detection c) Nucleic acid detection c) Culture d) Viral specific antibody detection e) Molecular detection methods to include molecular diagnosis of infectious diseases- – to be included as Molecular diagnosis practical	Micro	Module coordinator	Lecture Practical
36. Topics 25 to 37 MCQs	3 h	Objectives of topics 25 - 37	Micro	Module coordinator	SGD
<b>Introducing medically important fungi</b>					
37. Superficial mycoses	1h	1. Describe fungi associated with human infections including	Micro	Module coordinator	Lecture

38. Sub cutaneous and deep mycoses	1h	laboratory diagnosis and principals of treatment	Micro	Module coordinator	Lecture
39. Topics 1 - 37 – MCQs	4h 3h	Objectives of topics 1– 40	Micro	Module coordinator	SGD
40. Topics 1 – 38	2 h	Objectives of topics 1 – 40	Micro + Parasit	Module coordinator	Assignment
41. Malaria	1h	<ol style="list-style-type: none"> <li>1. Name the human malarial parasites</li> <li>2. Describe the life cycle of <i>Plasmodium</i> species</li> <li>3. Discuss the diagnostic importance of erythrocytic stages in peripheral circulation.</li> <li>4. Evaluate the methods of laboratory diagnosis</li> <li>5. Discuss the preventive measures based on the life cycle.</li> </ol>	Parasit	Module coordinator	Lecture
42. Invasive intestinal protozoa - (amoebae and ciliate)	1h	<ol style="list-style-type: none"> <li>1. Name the common intestinal amoebae and the ciliate that infect humans</li> <li>2. Outline the life cycle of <i>Entamoeba histolytica</i> indicating the infective, pathogenic and diagnostic stages.</li> <li>3. Describe the pathogenesis and clinical features of amoebiasis</li> <li>4. Identify points in the life cycle where preventive measures are applicable.</li> <li>5. Discuss the methods of laboratory diagnosis of the infections</li> </ol>	Parasit	Module coordinator	Lecture
43. Other intestinal and urogenital protozoa – <i>Giardia duodenalis</i> , <i>Cryptosporidium</i> species and <i>Trichomonas vaginalis</i>	1h	<ol style="list-style-type: none"> <li>1. Name the intestinal and tissue flagellates that infect humans and state their habitats</li> <li>2. Name the intestinal coccidia that infect humans</li> <li>3. Outline the life cycle of <i>Giardia duodenalis</i>, <i>Trichomonas vaginalis</i> and <i>Cryptosporidium</i> species indicating the infective, pathogenic</li> </ol>	Parasit	Module coordinator	Lecture

		<p>and diagnostic stages.</p> <ol style="list-style-type: none"> <li>Describe the pathogenesis and clinical features.</li> <li>Evaluate the methods of laboratory diagnosis.</li> <li>Discuss the preventive measures based on the life cycle</li> </ol>			
44. Haemoflagellates	1 h	<ol style="list-style-type: none"> <li>Name the parasite(s) causing human leishmaniasis in Sri Lanka</li> <li>Name the vector of human leishmaniasis in Sri Lanka</li> <li>Discuss the prevention and control of leishmaniasis in Sri Lanka.</li> <li>Describe the pathogenesis and clinical manifestations of leishmaniasis</li> <li>Evaluate the methods of laboratory diagnosis of leishmaniasis</li> <li>Name the parasites and vectors causing trypanosomiasis</li> <li>Outline the geographical distribution, clinical features and laboratory diagnosis of African and American trypanosomiasis</li> </ol>	Parasit	Module coordinator	Lecture
45. Tissue coccidian ( <i>Toxoplasma gondii</i> and <i>Sarcocystis</i> species)	1h	<ol style="list-style-type: none"> <li>Name the tissue coccidia that infect humans</li> <li>Outline the life cycle of <i>Toxoplasma gondii</i> indicating the infective, pathogenic and diagnostic stages.</li> <li>Discuss the prevention and transmission of toxoplasmosis</li> <li>Evaluate the methods of laboratory diagnosis of toxoplasmosis (congenital and acquired)</li> </ol>	Parasit	Module coordinator	Lecture
46. Helminths-Intestinal Nematodes <i>Ascaris lumbricoides</i> <i>Necator americanus</i> <i>Trichuris trichiura</i>	2 h	<ol style="list-style-type: none"> <li>Name the common intestinal nematodes in humans</li> <li>Describe the major morphological characteristics of parasitic</li> </ol>	Parasit	Module coordinator	Lecture

<p><i>Enterobius vermicularis</i>  <i>Strongyloides stercoralis</i></p>		<p>nematodes</p> <ol style="list-style-type: none"> <li>Outline the life cycle of intestinal helminths indicating the infective, pathogenic and diagnostic stages.</li> <li>Describe the pathogenesis and clinical features.</li> <li>Evaluate the methods of laboratory diagnosis of intestinal nematode infections</li> <li>Discuss the prevention and control of intestinal nematode infections.</li> </ol>			
<p>46. Tissue nematodes - filarial worms</p>	<p>1 h</p>	<ol style="list-style-type: none"> <li>Name the major tissue nematodes of humans indicating those found in Sri Lanka.</li> <li>State their location in the human body.</li> <li>Name the vectors of tissue nematodes found in Sri Lanka</li> <li>Discuss the importance of periodicity of microfilaria in relation to transmission and diagnosis.</li> <li>Outline the life cycle of <i>Wuchereria bancrofti</i> and <i>Brugia malayi</i> indicating the infective, pathogenic and diagnostic stages.</li> <li>Evaluate the methods of laboratory diagnosis of filariasis</li> <li>Discuss the prevention and control filariasis</li> </ol>	<p>Parasit</p>		
<p>47. Cestodes and Trematodes  <u>a.Cestodes</u>  <i>Taenia solium</i>, <i>Taenia saginata</i>,  <i>Hymenolepis diminuta</i>,  <i>Hymenolepis nana</i>,</p>	<p>1 h</p>	<ol style="list-style-type: none"> <li>State the major morphological characteristics of the different groups of parasitic cestodes and trematodes of humans</li> <li>Outline the life cycles of cestodes and trematodes indicating the infective,</li> </ol>	<p>Parasit</p>	<p>Module coordinator</p>	<p>Lecture</p>

<i>Echinococcus granulosus</i> <u>b.Trematodes</u> Intestinal, tissue and blood trematodes		pathogenic and diagnostic stages.  3. Evaluate the methods of laboratory diagnosis of cestode and trematode infections. 4. Discuss the prevention and control.			
48. Arthropods of medical importance 1 - mosquitoes	1 h	1. Name the major mosquito borne diseases in Sri Lanka and worldwide indicating the disease(s) that they transmit  2. Outline the life cycle of a mosquito 3. Describe the breeding habits of medically important mosquito species in Sri Lanka indicating strategies used for prevention and control.	Parasit	Module coordinator	Lecture
49. Parasites of global importance	1h	1. Name the parasitic diseases of global importance 2. Name the-parasites causing schistosomiasis and food borne trematode infections 3. Outline the mode of transmission of schistosomes and important food-borne trematodes 4. Describe the clinical features of schistosomiasis and important food-borne trematode infections. 5. State the methods of laboratory diagnosis of these infections 6. Outline the prevention and control strategies of these infections	Parasit	Module coordinator	Lecture
49. Arthropods of medical importance - 2 a.) Flies b)Fleas, lice and bugs c)Ticks and mites &	1 h	1. Define the terms mechanical and biological vectors (recall) 2. Flies <ul style="list-style-type: none"> <li>• Explain the importance of housefly as a mechanical vector of disease</li> <li>• Name the other groups of flies that</li> </ul>	Parasit	Module coordinator	Lecture
			Parasit	Module coordinator	Lecture

50. Animal bites and stings		<p>are medically important</p> <ul style="list-style-type: none"> <li>• Describe myiasis</li> </ul> <p>3. Ticks/fleas/bugs</p> <ul style="list-style-type: none"> <li>• Differentiate ticks, fleas and bugs from each other</li> <li>• Outline their medical importance</li> </ul> <p>4. Mites</p> <ul style="list-style-type: none"> <li>• Name major morphological characteristics of <i>Sarcoptes scabiei</i> mite</li> <li>• Outline the life cycle</li> </ul> <p>5. Lice</p> <ul style="list-style-type: none"> <li>• Differentiate the three types of lice (head , body and pubic)</li> <li>• Name the drugs used for treatment</li> </ul> <p>6. Describe the prevention and control methods of vectors and ectoparasites.</p> <ol style="list-style-type: none"> <li>1. State the common animal bites in Sri Lanka</li> <li>2. State the primary and secondary effects of animal bites</li> <li>3. Name the organisms that cause secondary infections of the animal bites</li> <li>4. State the common marine animal and arthropod stings</li> <li>5. Discuss the effects of stings</li> </ol>			
51. Poisonous snakes and envenomation	2 h	<ol style="list-style-type: none"> <li>1. Name the important snakes which belongs to the families- Elapidae, Viperidae and Colubridae</li> <li>2. Name the poisonous snakes in Sri Lanka</li> <li>3. Name the common (important ) non-poisonous snakes in Sri Lanka</li> <li>4. Name the main phenotypic</li> </ol>	Parasit	Module coordinator	Lecture

		<p>characteristics of these (2 and 3) if shown a specimen/ an image (see demonstration on snakes)</p> <ol style="list-style-type: none"> <li>5. State the major effects of snake venom in different groups of poisonous snakes in Sri Lanka</li> <li>6. State the principles underline the treatment and management of snake bites</li> <li>7. State the precautions that should be taken to prevent snake bite</li> </ol>			
52. Demonstration on venomous snakes	1 hour x 4 groups	<ol style="list-style-type: none"> <li>1. Identify medically important snakes of Sri Lanka if shown specimens or image</li> </ol>	Parasit	Module coordinator	Demonstration
53. Demonstration on intestinal protozoa and helminths	1 h x 4 groups	<ol style="list-style-type: none"> <li>1. Identify pathogenic and non pathogenic intestinal amoeba, intestinal and urogenital flagellates on the stained and wet smears</li> <li>2. Identify the specimens of adults and eggs of intestinal nematodes</li> </ol>	Parasit	Module coordinator	Demonstration
54. Demonstration on tissue protozoa, arthropods	1 h x 4 groups	<ol style="list-style-type: none"> <li>1. Be able to identify the mosquitoes , flies fleas and mites of medical importance by their body markings</li> <li>2. Identify <i>Leishmania</i> amastigotes on stained slide</li> <li>3. Identify the trypomastigotes of trypanosomes on stained slide</li> <li>4. Identify malarial parasites on stained thin and thick smear</li> <li>5. Identify adult taenid segments and cestode larval stages</li> <li>6. Identify schistosomes adult and eggs</li> </ol>	Parasit	Module coordinator	Demonstration

<p>55. Practical  a) Faecal smear preparation and examination for intestinal protozoan and helminthes   b) Thick and thin blood smear examination for malaria parasites</p>	<p>1 h x 4 groups</p>	<p>Practical skills to be acquired</p> <ol style="list-style-type: none"> <li>1. Be able to properly use the compound light microscope</li> <li>2. Discuss the principles regarding collection, storage and delivery/transport of faecal and blood specimens to a laboratory for diagnosis of parasitic infections</li> <li>3. Be able to examine stained thin blood films and identify malaria parasites (<i>Plasmodium falciparum</i> and <i>Plasmodium vivax</i>)</li> <li>4. Be able to prepare and examine wet smear of stools in saline and iodine to identify intestinal protozoal and helminth parasites</li> </ol>	<p>Parasit</p>	<p>Module coordinator</p>	<p>Practical</p>
<p>56. Topics 40 - 55</p>	<p>3 h</p>	<ol style="list-style-type: none"> <li>1. Objectives of topics 40 – 55</li> </ol>	<p>Parasit</p>	<p>Module coordinator</p>	<p>SGD</p>

**As clinical MSGOP appointments started and semester reduced to 14 weeks (due to security closures) additional 1-4pm time slots provided on Monday afternoons in addition to the regular 8am -12pm and 1-4pm slots on Tuesday and 1-4pm slot on Thursday.**