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POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO, SRI LANKA

PROSPECTUS

THE POSTGRADUATE DIPLOMA

IN

MEDICAL MICROBIOLOGY

2013

CONDUCTED BY BOARD OF STUDY IN MICROBIOLOGY

CONTENTS

Amendments to Post Graduate Training Programme
Postgraduate Diploma in Medical Microbiology
Conducted by Board of Study in Microbiology
PGIM, University of Colombo - Approved in 2011 *(To be effective from 2012.)*

BACKGROUND TO THE PROGRAMME:
The Diploma in Medical Microbiology is the 1st stage of a 3-part training programme conducted by the PGIM's Board of Study in Microbiology for those who wish to specialize in the field of Medical Microbiology. The first Diploma programme was conducted in the early 1980's. Since then it has been reviewed and revised on several occasions to serve the evolving needs of the country in relation to the field of Medical Microbiology, and taking into account changes in training capacity.
The current Diploma training programme, which takes the form of a formally organized, face-to-face, taught course, was first put into effect about 10 years ago. It consists mainly of laboratory-based practical work, but it also includes lectures, seminars, tutorials and assignments. It is an intensive, full-time course of 14 months duration, conducted by designated trainers in several centers approved by the Board for this purpose. The period of training under approved supervision covers Bacteriology, Virology, Mycology, Parasitology, Immunology, Molecular Biology and allied subjects approved by the Board of Study. All trainees selected to follow the course in any given year are trained together in these centres.

RATIONALE FOR PROPOSED CHANGE
At present, the Board of Study in Microbiology offers 2 Diplomas (Medical Microbiology and Clinical Microbiology) and 3 MDs (Microbiology, Parasitology, and Virology). The Diploma in Medical Microbiology training programme (described above) has been running for several years now and it is a pre-requisite for entry into all 3 MD programmes. The 2.5 year Diploma in Clinical Microbiology programme was launched in 2009 at the specific request of the Ministry of Health, in order to meet a national need for Medical Officers trained in Microbiology, who could run the microbiology laboratory services in a basic hospital. These Diploma holders are eligible for entry into the MD Microbiology programme only after serving two years as a PGIM trainee in Microbiology in various hospitals.
The Board of Study acknowledges the need for training medical officers who can serve as MO Microbiology, but limitations in resources (human and other) makes it extremely difficult for the Board to run two simultaneous Diploma programmes. Therefore, the Board proposes to revise its training programmes to conduct a single training programme that will enable Diploma holders to either directly enter MD training (Clinical Microbiology / Virology / Parasitology) or exit from training to serve as a MO / Microbiology in a hospital that provides basic microbial diagnostic services.

1. PROGRAMME AIMS
Diploma holders should be able to either directly enter MD training (Clinical Microbiology / Virology / Parasitology) or exit from training to serve as a MO / Microbiology in a hospital that provides basic microbial diagnostic services.

2. LEARNING OUTCOMES
A. *Scientific Basis of Medical Microbiology*
- aetiology, pathogenesis, epidemiology and prevention of infectious diseases that occur in Sri Lanka
- Laboratory investigations for the diagnosis of common bacterial, viral, fungal and parasitic diseases.

- sterilization procedures and laboratory investigations to check sterility
- antimicrobials and antimicrobial susceptibility testing of common pathogens

B. Laboratory skills

- process samples sent for routine microbiological investigations in a clinical diagnostic laboratory,
- report on microbial pathogens in clinical samples and their antimicrobial susceptibility
- Work with due attention to quality assurance and laboratory safety.
- Instruct on collection and transportation of samples for microbiological diagnosis

C. Laboratory Management

- Manage the microbiological laboratory services and the work environment of a microbiology laboratory in a district or base hospital.

D. Patient management

- Advise clinicians on antimicrobial and microbiological management of patients with infections, by liaising with an identified Specialist Microbiologist, Mycologist, Virologist or Parasitologist.

E. Infection control

- oversee infection control activities in a district or base hospital and advise on infection control procedures (including disease surveillance and outbreak investigation) under the supervision of a Specialist Microbiologist

3. ENTRY CRITERIA

a) A medical degree registrable with the Sri Lanka Medical Council and
b) One year of internship recognized by the Sri Lanka Medical Council and
c) One year of full-time post internship work experience in the health sector, recognized by the Board of Study in Microbiology

4. SELECTION PROCESS

a) The PGIM will place an advertisement to select a pre-determined number of candidates (as determined each year by the Board of Study in Microbiology).
b) Trainees are selected based on the overall mark obtained at the Qualifying Examination, which has 3 components: an essay paper, a Multiple Choice Question paper and an interview.
c) The essay paper requires the candidate to write an essay in 30 minutes, on a topic meant to judge general ability, creativity and maturity.
d) The MCQ paper, which has 30 MCQs of the multiple true / false type, to be answered in 90 minutes, includes questions on Microbiology and Parasitology at undergraduate level.
e) Only candidates who obtain a minimum of 50% in the theory exam (essay paper and MCQ paper combined) will be summoned for the interview.
f) The interview is intended to assess past academic achievement, participation in research projects, presentations and publications, as well as the need for training. Three examiners will assess the candidates at the interview, which will last for 10 to 15 minutes for each candidate
g) A candidate must obtain a minimum of 50% of the overall mark in order to qualify for selection for the training programme.
h) Candidates will be selected to the course according to rank order of overall marks at the selection exam.

i) Allocation of marks

	Component	% of final aggregate
1.	MCQ paper	75
2.	Essay question	15
3.	Interview	10
	Total	**100**

5. INTAKE

This number will be about 10 – 12. It will depend on the needs and availability of training facilities. The information will be stated in the advertisement.

6. DURATION OF TRAINING

14 months

7. FORMAT OF TRAINING PROGRAMME

The training programme will consist of two components: a 9-month taught course followed by 5 months of hospital-laboratory based practical in-service training combined with monthly continuing professional development (CPD) activities. This will be followed by two weeks of study leave and a summative examination.

The various components of the new course consist of learning activities that comprise the following credit hours:

Taught course	26 credit hours
In-service practical training	10 credit hours
Monthly CPD sessions	4 credit hours
Total	**40 credit hours**

A. Components of taught course

Module	Duration (weeks)	Lectures (hrs)	Practical (hrs)
1) Orientation	2	10	24
2) General Bacteriology	5	25	60
3) Systematic Bacteriology	9	45	90
4) Virology	5	25	75
5) Immunology	3	15	36
6) Mycology	3	15	36
7) Parasitology	3	15	36
8) Sexually transmitted infections	2	10	24
9) Molecular Biology	2	10	24
10) Clinical Microbiology	2	10	24
Total	**36 weeks**	**180 hrs**	**429 hrs**

On the basis that one credit is equivalent to 15 hours of lectures or 30 hours of practical classes, these contact hours in the taught course are the equivalent of 26 credits.

The Medical Research Institute will be the main training centre. Trainees may be sent to other sites approved by the Board of Study as and when necessary.

B. Hospital based training

In-service training will consist of hospital lab-based practical training under the direct supervision of a Specialist Microbiologist for a period of 5 months. Training sites will include Microbiology laboratories in the following hospitals:

- Lady Ridgeway Children's Hospital
- Kandy Teaching Hospital
- Kurunegala General Hospital
- Ratnapura General Hospital
- Galle Teaching Hospital
- Any other General / Base Hospital with a Consultant Microbiologist on site, other than the NHSL, CNTH and CSTH

On the basis that 60 hours of such in-service training is equivalent to one credit, this amounts to 10 credit hours.

Monthly classes of 2 days duration, on specific topics, will be conducted throughout the period of in-service training. Examples of possible topics include:

- Introduction to infection control and laboratory safety
- Rational use of antibiotics
- Investigation of outbreaks and outbreak control
- Quality assurance and quality control
- Laboratory management and administration
- Surveillance
- Viral fever with / without rash
- Viral fever with haemorrhage
- Viral hepatitis
- Viral encephalitis
- Viral congenital infections
- Viral respiratory infections
- Viral gastroenteritis
- Viral communicable diseases (measles, mumps, chickenpox)
- Post-exposure prophylaxis in rabies, HBV, VZV
- Viral vaccines, viral chemotherapy

These monthly classes will continue throughout the 1st year of MD training when trainees continue their in-service training in a peripheral hospital with off-site supervision.

These teaching sessions amount to the equivalent of 4 credit hours.

8. IDENTIFICATION OF TRAINERS

Trainers recognized by the Board of Study for the Diploma in Microbiology have at least three years experience after Board certification in the field of Medical Microbiology, Medical Parasitology, Medical Virology, Medical Mycology, Immunology or Molecular Biology, or at least five years experience after obtaining a Doctoral degree or a Masters degree (obtained after a full-time course of study of at least of 02 academic years' duration with a research component by way of thesis / dissertation), in the above mentioned fields of study.

The current list of trainers is shown in Annexure 1

9. FORMAT OF ASSESSMENTS

Assessment of trainees will include in-course assessment and end-of-course final examination.

A. In-course assessment

- Formative in-course assessment will include a portfolio compiled as stipulated by the Board of Study (see Annexure 2). This portfolio must be submitted to the PGIM at the end of the 5 months of in-service training as a pre-requisite to sit for the final examination. The portfolio will be assessed and the mark will contribute to the final examination.
- Trainers will be required to send progress reports on the trainees (annexure 3). Unsatisfactory reports will result in candidates being **requested to extend the training period or** discontinued from the training programme.
- Satisfactory participation at lecture / demonstrations, tutorials and seminars

B. Eligibility to sit for end-of-course assessment (Final Examination)

In order to be eligible to sit for the final examination, trainees must

1) Show at least 80% attendance in
    a. the classes conducted in each of the 10 modules in the taught course
    b. the period of in-service training in one or more hospital laboratories
    c. the monthly classes conducted during the period of in-service training
2) Obtain a satisfactory progress report from the assigned trainer(s) for in-service training
3) Submit a duly completed portfolio.

C. End-of-course assessment (Final Examination)

A final examination will be conducted at the end of the training period. It will have the following components

1) **Theory component** with multiple choice questions and structured essay question papers
2) **Practical component** with Objective Structured Practical Examination (OSPE) and Lab procedures in bacteriology tested over 2 half-days
3) **Portfolio Assessment**

The Multiple Choice Question paper will have 50 questions in the multiple true / false type and 10 in the single best answer type, to be answered in a total of **2 hours**. The number of questions from each sub-speciality area will be as follows:

	Number of questions	**Marks**
Multiple T/F type		
Bacteriology	18	90
Virology	10	50
Parasitology	08	40
Mycology	07	35
Immunology	07	35
Single Best Answer type		
Clinical Microbiology	10	40
Total	**60**	**290**

The Structured Essay Question paper will have 6 questions (no choice) to be answered in 3 hours. The number of questions from each sub-specialty will be as follows:

Sub-specialty	No of questions	Marks
Bacteriology	2	200
Virology	1	100
Parasitology	1	100
Immunology	1	100
Mycology	1	100
Total	**6**	**600**

The **OSPE** will assess practical competencies listed in the curriculum in relation to each sub-specialty area. The number of stations in area will be as follows and the total shall be 20.
The time allocated to each station shall be 3 minutes.

Subspecialty	No of stations	Marks
Bacteriology	10	100
Virology	05	50
Parasitology	02	20
Mycology	02	20
Immunology	01	10
Total	**20**	**200**

The **examination in lab procedures** will be held over two consecutive half-days (9 am to 1 pm) in the form of a hands-on practical test which will cover all areas of laboratory training. The test will comprise of 10 questions in microbiology, of which 4 bacteriology questions will be continued over both days. The other 6 questions will comprise of 02 in virology, 02 in parasitology, 01 in mycology and 01 in immunology. Each question shall be marked out of 20.
The **Portfolio** will be assessed by two examiners and marked out of 100 for the components **with the use of the marking grid** shown in Annexure 4. The contribution to the final examination will be 10%.

The final computation of marks shall be as follows:

Examination component	Marked out of	Percentage of final mark
MCQ paper	290	25
Essay question paper	600	25
OSPE	200	15
Practical examination	200	25
Portfolio assessment	100	10
Total	**1390**	**100**

D. Requirements to Pass the Examination
To qualify for the Diploma in Medical Microbiology candidates will be required to obtain the following:

- A total average of a minimum of 50% or more for the examination, and
- A minimum of 50% or more for the theory component (MCQ and Essay papers) and
- A minimum of 50% or more for the practical component (OSPE and **Practical Examination)**

E. Award of the Tissa Vitarana Gold Medal

The Tissa Vitarana Gold Medal shall be awarded to the candidate who meets **all of the** following criteria at the Diploma in Medical Microbiology examination:

a) The attempt shall be the candidate's first attempt at the examination and
b) The candidate shall have obtained a minimum of 70% of the total average mark and
c) The candidate shall have obtained the highest mark from among all candidates who have taken the examination in that year.

F. Repeat attempts

A candidate must complete the Diploma within **6** attempts in not more than 6 years from the date of passing the selection examination, unless the Senate has permitted extension for valid reasons.

A candidate who has obtained a total average of at least 50% for the examination, and has also obtained at least 50% in either the theory or the practical component, but has failed the examination because he / she has not obtained the requisite minimum mark in only one component, shall be permitted to sit for that component alone in his / her next attempt at the examination. In such a case, the total mark for the repeat examination shall be calculated using the marks from the portfolio assessment, and the passed component from the previous examination, along with the marks from the repeated component. A candidate shall be given this concession for only one subsequent repeat examination. In the event that a candidate does not pass the repeat examination, he / she shall have to sit for the entire examination again on the next occasion.

10. RECOMMENDED READING

1. Medical Microbiology by Greenwood, Slack and Peutherer
2. Practical Medical Microbiology by JG Collee, AG Fraser, BP Marmion and A Simmons
3. Cowan and Steel's Manual for identification of medical bacteria
4. Baily and Scott's Diagnostic Microbiology by Ellen JO Baron, Lance R Peterson, Sydney M Finegold.
5. Manual of Clinical Microbiology by Patrick R Murray, Ellen JO Baron, Michael A Pfaller, Fred C Tenover, Robert H Yolken
6. Basic Clinical Parasitology by Franklin A Neva and Harold W Brown. 6th Edition. Prentice Hall International Inc.
7. A Colour Atlas of Tropical Medicine and Parasitology by Peters and Gilles.
8. Immunology Donald M. Weir & John Stewart
9. Infectious diseases by Barbara A Banister, Norman T. Begg, Stephen H. Gillespie.
10. Medical Microbiology Cedric A. Mims, John HL Playfair,Ivan M. Roitt,D.Wakelin, R.Williams.
11. Microbiology & Infections T.J.J Inglis

11. DETAILS OF LEARNING MODULES

MODULE 1 - ORIENTATION

Learning objectives

At the end of this module, trainees should be able to do the following in relation to each of the specified areas:

1. State milestones in the history of Microbiology

2. Laboratory safety
    a. Enunciate the principles underlying laboratory safety practices
    b. Work safely in a routine diagnostic laboratory
        i. practice safe bench techniques for microscopy and bacterial culture
        ii. dispose of biological materials safely
        iii. follow work practices which are safe for the trainee and others
3. Microscopy
    a. Describe the principles of microscopy used in microbiology
    b. Use and maintain a light microscope with due care
    c. Describe the principles of micrometry and apply them to the study of microbes.
4. Sterilization and disinfection
    a. Operate an autoclave and hot air oven
    b. Wash and clean glassware and sterilize them
    c. Sterilize different media at appropriate temperature or using filtration
    d. Instruct or advise on the appropriate disinfectants to be used in different situations
5. Stains and staining procedures
    a. Prepare commonly used stains
    b. Make smears and stain them using the stains named above
    c. Describe accurately the normal, microscopic appearance of common bacterial pathogens
6. Media preparation
    a. Prepare commonly used media in a clinical microbiology laboratory: blood and chocolate agar; MacConkey agar; nutrient agar; BHI broth; MH agar. quality control process involved in the preparation of media.
7. Culture techniques
    a. Inoculate, incubate and read bacterial cultures using correct techniques
8. Quality control
    a. Enunciate the principles of quality control
    b. Describe and use appropriate quality control practices in the areas listed above
9. Laboratory equipment
    a. Describe and correctly use the equipment commonly found in a microbiology laboratory, with respect to safety, optimum function, QC and maintenance: centrifuges; weighing scales; ovens; incubators; refrigerators.
10. Literature retrieval
    a. Retrieve literature using the library, internet and other sources

Learning activities

Learning content	Activity	Time
Milestones in the history of Microbiology	Lecture	1 h
Importance & contribution of clinical microbiology in health care	Interactive discussion	2 h
Laboratory safety	Lecture / discussion	1 h
Principles and practice of microscopy – light microscopy, fluorescent, dark ground, phase contrast, electron	Lecture	1 h
Light microscopy and its uses; other microscopes	Practical	2 h
Sterilization and disinfection	Lecture	2 h
Use of autoclave and hot air oven; maintenance and quality assurance of autoclave and hot air ovens; washing and sterilization of glassware; preparation and testing of disinfectants for laboratory use and hospital use; sterilization and disinfection procedures in labs and hospitals	Practical Preparation of report by trainees	4 h
Important stains and staining procedures	Lecture	1 h
Demonstration of preparation of stains and staining techniques: Gram, Zeihl-Neelsen, Methylene blue, Albert's stain, lactophenol cotton blue, Parker's, Leishman, spore stain	Practical	2 h
Performing stains of smears, observing microscopic appearance of staphylococci, streptococci, coliforms, candida and fungi, and recording results	Practical	4 h
Use of computers in Medicine and Microbiology; online literature retrieval	Lecture	1 h
Internet access; networking in a computer lab	Group work	4 h
Bacterial growth, nutrition and growth requirements, types and uses of media, pH indicators and quality control of media	Lecture	2 h
Observe preparation of culture media	Demonstration practical	2 h
Prepare and quality control (QC) the following culture media: blood agar, chocolate agar, MacConkey agar, selenite F broth, nutrient agar, Sabouraud's glucose agar, Muller-Hinton agar; BHI broth	Practical	4 h
Laboratory equipment: choice, calibration, and maintenance	Lecture	1 h
Calibrate and write protocols for maintenance of incubators, water baths, centrifuges, refrigerators, pH meters	Group work in lab; Directed learning	6 h
Inoculation and examination of commonly encountered pathogens (*S. aureus*, coliforms, streptococci, etc)	Supervised practical	2 h
Quantification techniques: semi-quantitative, pour plate, MacFarland turbidity standards		
Observe and describe colony morphology, purity plates, inoculate to get isolated colonies, pick single colonies, keep detailed, neat records		
Formative assessment		
Examine cultures inoculated on previous day and record findings	Supervised practical	2 h
Evaluation of module by trainees		

Duration of module: 2 weeks

Direct contact hours: Lectures 10 hours
Practicals 24 hours

MODULE 2 - GENERAL BACTERIOLOGY

Learning objectives

At the end of this module, trainees should be able to do the following in relation to each of the specified areas:

1. List and describe the principles behind different classifications of bacteria
2. Structure and function of bacteria:
   a. Describe the structure and function of bacteria in relation to
      i. Bacterial cell components
      ii. Bacterial growth requirements
      iii. Metabolic pathways
      iv. Synthesis of cell constituents
   b. Describe the basis for specific growth requirements
   c. Discuss the application of different counting methods in medical microbiology
   d. Describe the biochemical basis of different tests used in the identification of bacteria
3. Bacterial genetics
   a. Define the terms genotype and phenotype
   b. Describe mutations in bacteria
   c. Describe the structure and function of plasmids
   d. Describe the mechanisms of transfer of genetic material
4. Host-parasite relationship
   a. Describe the relationship between host and parasite
   b. Describe pathogenic mechanisms exerted by bacteria, with examples
   c. Describe virulence factors and their role in pathogenicity
5. Describe different methods of maintenance of stock cultures of bacteria. The trainee should be able to
   a. Store bacterial cultures using different methods
   b. Discuss advantages and disadvantages of different methods
6. Biochemical tests for identification of bacterial genera and species:
   a. the trainee should be able to explain the basis, and describe the correct performance and correctly interpret the following biochemical tests: Carbohydrate hydrolysis and fermentation, VP, MR, bile-aesculin test, selenite, nitrate reduction, indole, gelatin liquefaction, hydrolysis of amino acids, starch, hippurate, aesculin, O-F test, citrate, production of enzymes and H2S, catalase, tween hyrolysis, growth in media containing inhibitory substances.
7. Outline the principles of typing methods of bacteria
8. Antimicrobials
   a. List different anti bacterial groups and tabulate antibacterials into each group
   b. Describe the method of action of antibacterial agents
   c. State the spectrum of activity of each antibacterial agent
   d. Describe the methods of testing antibacterial sensitivity
   e. Describe the different antibacterial resistance mechanisms demonstrated by bacteria.
   f. State principles of rational use of antibiotics
   g. Describe effects of misuse of antibiotics

Learning activities

Learning content	Activity	Duration
Introduction to Bacteriology	Lecture	1 h
Classification of microorganisms, structure and function of the bacterial cell	Lectures	4 h
Bacterial cell metabolism and synethesis of cell constituents; biochemical basis of different bacteriological tests	Lectures	4 h
Performance of biochemical tests	Lab classes	20 h
Bacterial genetics – genotype, phenotype, mutation, genetic transfer, plasmids, recombination, gene morphology and regulation of genes	Lectures	4 h
Bacterial pathogenicity, host-parasite relationship, mechanism of bacterial infection, virulence	Lectures	4 h
Maintenance of stock cultures	Lectures	4 h
Maintenance of stock cultures of different bacteria	Lab classes	20 h
Antibacterial substances - Classification, mode of action of antibiotics, mechanisms of drug resistance, effects of misuse of antibiotics	Lectures	4 h
Antibiotic sensitivity testing using Joan Stokes method, CLSI method, MIC determination	Lab classes	20 h

Duration of module: 5 weeks

Direct contact hours: Lectures: 25 hours
Practicals: 60 hours

MODULE 3 - SYSTEMATIC BACTERIOLOGY

Learning objectives

At the end of this course in systematic bacteriology, trainees will be able to

1. List and classify bacteria of medical importance
2. Describe their microscopic features
3. Describe their habitat, routes of transmission, and mechanisms of pathogenesis of infections caused by them.
4. Describe their growth requirements and their culture characteristics in solid and liquid media
5. Make wet preparations and stained smears in order to recognize microscopic features and identify bacteria
6. Inoculate solid and liquid media
7. Obtain pure cultures from mixed growth by streaking on plate media
8. Perform biochemical and serological tests to identify the bacteria up to genus or species level as indicated below.

Learning activities

Learning content		Lectures	Supervised Practicals
Species	***Genus***		
Aerobic Gram positive cocci			
Staphylococcus aureus	Other coagulase negative staphylococci, *Micrococcus*	4 h	10 h
S. saprophyticus			
Streptoccus groups A, B, C, D, F & G	***Aerococcus***		
	Viridans streptococci		
S. pneumonia			
Enterococcus faecalis			
E. faecium			
Aerobic non spore forming & spore forming Gram positive bacilli			
Corynebacterium diphtheriae	Other corynebacteria	4 h	6 h
	Listeria		
Bacillus cereus	*Erysipelothrix*		
B. anthracis	Other aerobic spore bearers		
Mycobacteria and Gram positive filamentous bacteria			
Mycobacterium tuberculosis complex	Other mycobacteria	4 h	6 h
	Norcadia		
M. leprae	*Actinomyces*		
Gram negative cocci			
Neisseria gonorrhoeae	Other *Neisseria* sp.	2 h	5 h
N. meningitides			
Moraxella ctarrhalis			
Parvobacteria			
Haemophilus influenzae	Other *Haemophilus* sp.	2 h	2 h
H. parainfluenzae	Other *Bordetella* sp.		
H. ducreyi	*Brucella and Pasteurella*		
Bordetella pertussis	*Franciscella*		
Yersinia spp			
Other fastidious Gram negative bacilli			
	Legionella	2 h	2 h
	Gardnerella		
	Actinobacillus		
	Cardiobacterium		
	Eikenella		
	Kingella		
Enterobacteria			
Escherichia coli	*Serratia*	8 h	20 h
Klebsiella pneumoniae	*Enterobacter*		
Yersinia enterocolitica	*Citrobacter*		
	Proteus		
Typhoidal and non-typhoidal *Salmonella*	*Providencia*		
	Morganella		
	Edwardsiella		

Aerobic Gram negative non fermenters			
Pseudomonas aeruginosa *Burkholdia cepacia* *B. pseudomallei*	Other pseudomonads *Acenetobacter* Stenotrophomonas	2 h	5 h
Gram negative curved bacilli			
Vibrio cholerae *V. parahaemolyticus* *Helicobacter pylori*	Other vibrio *Campylobacter* *Aeromonas, Plesiomonas*	3 h	5 h
Treponema pallidum *Leptospira icterohaemorrhagiae*	Other treponemes Other leptospira ***Borrelia***	3 h	2 h
Anaerobic Gram positive spore forming bacilli			
Clostridium tetani *C. perfringens* *C. histolyticum* *C. botulinum* *C. difficile*	Other clostridia	4 h	10 h
Anaerobic non spore forming Gram positive & Gram negative bacilli			
Lactobacilli, *Propionbacterium* *Eubacterium, Bifidobacterium* *Peptococcus, Peptostreptococcus* *Bacteroides, Prevotella* *Fusobacterium, Leptotrichia, Mobiluncus*		4 h	8 h
Mycoplasma pneumonia Chlamydia	Rickettsiae Other mycoplasma *Coxiella* ***Rochalaemia*** *Erhlichia*	3 h	3 h

Duration of module 9 weeks
Direct contact hours: Lectures 45 h
Lab classes / tutorials 90 h

MODULE 4 – VIROLOGY

Learning objectives

At the end of this module, trainees should be able to carry out the following in relation to the areas listed below:

1 General virology
- 1.1 Describe the principles underlying the classification of viruses.
- 1.2 Describe the properties of the main groups of viruses of medical importance.
- 1.3 Describe the interaction between virus and host in viral infections, and the pathogenic mechanisms used by viruses, giving examples.
- 1.4 Describe the methods that can be used for the control of viral infections, including antiviral chemotherapy and vaccines.

2 Systematic virology

2.1 Describe the aetiological agents, the pathogenesis, epidemiology, and means of preventing transmission of the viruses that infect humans in Sri Lanka. These include Enteroviruses (polio, Coxsackie, echo), influenza A, B, and C, measles, mumps, respiratory syncytial virus and paramyxoviruses, rubella virus, Rhabdoviruses (rabies virus), arboviruses (Japanese encephalitis, dengue and yellow fever, chikungunya), hanta virus, Herpes viruses (herpes simplex types 1 and 2, varicella zoster, cytomegalo virus, Epstein Barr virus, human herpes virus 6, 7 and 8) Adeno viruses, Hepatitis viruses, Papovaviruses, Rota viruses, Corona viruses.

3 Practical competencies

3.1 Laboratory safety

3.1.1 Follow safe laboratory procedures required for virus work and handling of specimens.

3.1.2 Use a safety cabinet (laminar flow hood) for tissue culture work, handling of virus suspensions and clinical specimens.

3.1.3 Decontaminate surfaces and discard material used for virus work.

3.1.4 Sterilize glassware and tissue culture media for virological work.

3.2 Diagnostic virology

3.2.1 Organise and use a laboratory bench in an orderly fashion for virological work.

3.2.2 Use and maintain the basic items of equipment used in virological work. E.g. Liquid Nitrogen, -20° and -70° C freezers, centrifuges, microscopes etc.

3.2.3 Display correct techniques in holding and using pipettes and micropipettes, and in transferring media or diluent between containers / vials.

3.2.4 Prepare stains, media and buffers necessary for virological work. i.e. Sellers stain, Phosphate buffered saline, tissue culture media.

3.2.5 Make serial dilutions of virus suspensions or sera for virus assays, tissue culture or serology using pipettes and micropipettes.

3.2.6 Collect and transport specimens for virological diagnosis.

3.2.7 Make smears on slides for detection of viral antigen.

3.2.8 Recognise cytopathic effect in virus infected cell cultures, tissue sections or smears for identification of specific viral types.

3.2.9 Determine virus neutralisation titre or tissue culture infective dose (TCID50)

3.2.10 Perform an ELISA, IFA, RPHA, PHA, HA, HAI, Immunochromatography using a commercial kit / in-house protocol for detection of virus antigen or antibody to virus infection.

3.2.11 Ability to understand the principal & the basic steps of molecular techniques used in viral diagnosis.

3.2.12 Ability to validate, interpret & comments on results of virological assays (isolation, serology & molecular assays)

Learning activities

Learning content	**Activity**	**Time**
Viral structure, classification, multiplication and genetics	Lecture	2 h
Pathogenesis of viral infections	Lecture	2 h
Principles and techniques of diagnostic virology and reporting: serology, virus isolation and molecular assays	Lecture	1 h
Diagnostic serology	Lab classes / demonstration	6 h

Principles and techniques of diagnostic virology and reporting: virus isolation and molecular assays	Lecture	2 h
Diagnostic virology	Lab class / demonstration	5 h
Laboratory safety	Lab classes	3 h
Inverted microscope & EM	Lab demonstration	1 h
Epidemiology & Surveillance of viral infections	Lecture	1 h
Antiviral chemotherapy	Lecture	1 h
Specimen collection, storage and transport	Lecture	1 h
Specimen collection, storage and transport	Lab class	1 h
Hepatitis viruses (HBV, HDV, HCV, HAV, HEV)	Lecture	3 h
Practical	Lab classes	8 h
Herpes viruses (HSV 1 & 2, VZV, EBV, CMV, HHV 6,7 & 8)	Lecture	2 h
Practical	Lab classes	6 h
Pox & vaccinia viruses	Tutorial	1 h
Picorna viruses (PV, ECHO, Coxsackie, EV)	Lecture	1 h
Practical	Lab classes	8 h
Orthomyxoviruses (Influenza A, B and C), adenoviruses,	Lecture	1 h
Paramyxoviruses – RSV, Parainfluenza,	Lecture	1 h
Mumps virus, measles virus	Lecture	1 h
Practical	Lab classes	8 h
Arboviruses (DV, JE, Chikungunya, WNV, Hanta virus)	Lecture	2 h
Practical	Lab classes	8 h
Rubella	Lecture	1 h
Practical	Lab classes	4 h
Rota virus and acute gastro-enteritis viruses	Lecture	1 h
Practical	Lab class	2 h
Rhabdoviruses – rabies	Lecture	1 h
Practical	Lab classes	5 h
Retroviruses, Oncoviruses & slow viruses	Lecture	1 h
Papova & parvo viruses	Tutorial	1 h

Duration of module	5 weeks	
Direct contact hours	Lectures	25 h
	Lab classes / tutorials	67 h

MODULE 5 - IMMUNOLOGY

Learning objectives

At the end of this module, trainees should be able to

1. Describe the embryology, anatomy, & physiology of the immune system.
2. Describe the immune mechanisms, especially in relation to microbial infections.
3. Describe the basic mechanisms of immune response to tumour & transplantation antigens.
4. Explain how the immune system can damage the host tissues. E.g. autoimmunity & hypersensitivity.
5. Explain the immune regulatory mechanisms in natural & artificial situations. E.g. tolerance, natural immune regulation and immune manipulation including immunization.
6. Explain the basis of immunological techniques.

Learning activities

Learning content	Lectures	Lab classes
Introduction to immunology; overview of immune system Cells and tissues of the immune system, lymphocyte trafficking and adhesion molecules Innate immune response, complement system & cytokines Serum electrophoresis, radial immuno-diffusion; evaluation of clinical problems Directed learning	1 h 1 h 2 h	 10 h 21 h
Antigens, antibodies and humoral immunity MHC molecule, antigen presentation & cell-mediated immunity Immunological techniques Immunity to bacterial and fungal infections Isolation of mononuclear lymphocytes, analysis of lymphocyte subsets by immunofluorescence and flow cytometry, neutrophil function test (NBT), evaluation of clinical problems Directed learning	1 h 2 h 1 h	 1 hr 09 h 21 h
Immunity to viral infections	1 h	
Immunity to parasitic infections	1 h	
Immune deficiency	1 h	
Hypersensitivity	1 h	
Detection of auto-antibodies by Indirect immuno-fluorescence (ANA, ANCA, anti-smooth muscle antibodies, anti-mitochondrial antibodies, organ-specific antibodies); Direct immuno-fluorescence (bullous disease); Latex agglutination test (rheumatoid factor); Cryoglobulins; Evaluation of clinical problems		10 h
Directed learning		21 h
Autoimmunity and tolerance	1 h	
Immunology of transplantation & immune manipulation	1 h	
Immunization	1 h	
Animal experiments (maintenance of murine malaria model, rosette forming assay for lymphocytes) Evaluation of clinical problems		10 h
Directed learning		21 h

Duration of module 3 weeks

Direct contact hours Lectures 15 h
Supervised practicals / tutorials 36 h

MODULE 6 - MYCOLOGY

Learning objectives

At the end of this module, trainees should be able to carry out the following in relation to the areas listed below.

1 General mycology
   1.1 List and classify fungi causing human infections.
   1.2 Describe the fungal structure and morphology.
2 Superficial fungal infections
   2.1 Describe the aetiological agents and clinical features of fungal infections of keratinised tissues e.g. Skin, hair & nails
   2.2 Describe the collection and transport of specimens from superficial fungal infections
   2.3 Prepare direct smears (KOH, Parkers stain & Gram stain) of specimens and recognise microscopic features of fungi in specimens
   2.4 Culture specimens on appropriate media & recognise the colony characteristics of common dermatophytes and other fungi
   2.5 Perform tease mount preparations and slide cultures of fungi, to identify their microscopic features
3 Subcutaneous fungal infections
   3.1 Describe the aetiological agents and clinical features of subcutaneous fungal infections
   3.2 Describe the collection and transport of specimens from subcutaneous fungal infections
   3.3 Recognise the colony characteristics of fungi causing subcutaneous fungal infections
   3.4 Perform tease mount preparations & slide cultures to identify their microscopic features
4 Systemic fungal infections
   4.1 Describe the aetiological agents, pathogenesis, clinical features and treatment of fungi causing systemic diseases
   4.2 Describe the collection and transport of specimens from systemic fungal infections
   4.3 Recognise the colony characteristics of fungi causing systemic diseases
5 Opportunistic fungal infections
   5.1 Describe the aetiological agents, pathogenesis and clinical features of fungi causing opportunistic infections
   5.2 Describe the collection and transport of specimens from opportunistic fungal infections
   5.3 Recognise the colony characteristics of fungi causing opportunistic fungal infections
   5.4 Perform tease mount preparations to identify their microscopic features
   5.5 Identify yeasts by microscopy, germ tube test, morphology on corn meal agar, assimilation & fermentation tests
6 Anti-fungal agents
   6.1 Classify & describe the mode of action , spectrum, side effects and uses of antifungal agents
7 Describe the principles and outline the methodology of serological tests used in the diagnosis of fungal infections.

Learning activities

Learning Content	Activity	Time
Classification, structure and morphology of fungi: Ascomycetes, Basidiomycetes,Zygomycetes, Deuteromycetes	Lecture	1 h
Superficial fungal infections: Dermatophytosis, Kerion, Onychomycosis Pityriasis versicolor, Candidiasis, Black & white Piedra, Tinea nigra *Trichophyton rubrum, T. mentagrophytes* *Microsporum gypseum, M. canis* *Epidermotophyton floccosum, Candida,* *Fusarium, Aspergillus & Penicillium* species *Piedra hortae, Trichosporon beigellii, Cladosporium wernikeii*	Lecture Practicals	3 h 10 h
Subcutaneous fungal infections: Chromoblastomycosis, Mycetoma Sporotrichosis, Rhinosporiodiosis Phaeohyphomycosis *Fonsecea pedrosoi*, *Cladosporium carrionii* Systemic fungal infections: Histoplasmosis, Blastomycosis Coccidiomycosis *Histoplasma capsulatum*	Lectures Practicals Lectures Practicals	2 h 4 h 2 h 6 h
Opportunistic fungal infections: Aspergillosis, Mucormycosis, Penicilliosis *Candida albicans, C. parapsilosis, C. tropicalis, C. krusei, C glabrata, Cryptococcus species* Antifungal agents: Polyenes, Azoles, Griseofulvin, 5 flucytosine	Lectures Practicals Lectures Lectures	2 h 10 h 2 h 1 h
Serological tests in the diagnosis of fungal infections	Lectures Practicals	2 h 4 h

Duration of module 3 weeks
Direct contact hours Lectures 15 h, Supervised Practical / Tutorials 34 h

MODULE 7 - PARASITOLOGY

Learning objectives
At the end of this module, trainees should be able to

1. Describe the aetiology, pathogenesis, epidemiology and prevention of parasitic infections that are common in Sri Lanka (namely malaria, filariasis, amoebiasis, giardiasis, cryptosporidiosis, blastocystosis, intestinal helminth infections, trichomoniasis, toxoplasmosis, pneumocystosis, leishmaniasis, scabies)
2. Carry out and interpret results of parasitological investigations for these infections.
3. Use correctly and maintain laboratory equipment essential for the diagnosis of these infections.
4. Describe the life cycles, breeding habits, and biology relating to disease causation or transmission, of medically important arthropods in Sri Lanka (mosquitoes, flies, fleas, lice, ticks, mites).
5. Identify the arthropods of medical importance in Sri Lanka.

Practical competencies

Trainees should be able to:

1. Use compound and stereo microscopes with an external light source or in-built illumination
2. Process samples of stools, specifically
   a. Prepare and examine wet mounts in saline and iodine for intestinal protozoa and helminths
   b. Identify trophozoites, cysts, ova and larvae of common intestinal parasites
   c. Carry out zinc sulphate and formol-ether concentration techniques to demonstrate ova and cysts.
   d. Carry out a Kato-Katz thick smear to demonstrate helminth ova
3. Prepare and process thick and thin blood films, specifically
   a. Prepare and stain blood films and identify malarial parasites
   b. Prepare and stain blood films for filarial parasites
4. Recognise specimens of arthropods of medical importance in Sri Lanka
5. and diagnosis.
6. Wash and prepare slides, cover slips and glassware for above named procedures.
7. Given a laboratory manual, prepare reagents required for these procedures.
8. Follow safe laboratory procedures in correct disposal of material used in above procedures.

Learning activities

Topic	**Lectures (h)**	**Labs / tutorials (h)**
Introduction to Parasitology module Lymphatic filariasis: Filarial parasites, clinical spectrum; epidemiology and control Laboratory diagnosis of filariasis: thick smears; staining techniques; membrane filtration; Knott's concentration; immunodiagnosis, including RDTs;	4	12
Malaria, overview, the nature of the parasites, species influence on clinical disease outcome, relapses, drug resistance Clinical evaluation, clinical presentations, current Sri Lanka situation, clinical spectrum, severe and complicated malaria, epidemiology & control Preparation of thin and thick blood films and staining. Identification malaria blood stage parasites. Preparation of Leishman and Giemsa stains; Immunoassays for malaria diagnosis; use of P.C.R. technique Immunity (anti-parasite and anti-disease); immuno pathology; vaccines Literature survey on pathogenesis and control of malaria Leishmaniasis: nature of parasites, disease, diagnosis, relevance to Sri Lanka Preparation and staining of skin smears for diagnosis of leishmaniasis	5	12
Toxoplasmosis: parasite biology, clinical presentations, laboratory diagnosis; interpretation of serological tests	1	2

Intestinal helminths and protozoa Stool examination for intestinal parasites Faecal concentration techniques (ZnSO4, formol-ether), Kato-Katz technique, Harada-Mori cultures Staining stool smears for Cryptosporidium Culture techniques for amoebae & Trichomonas Medically important arthropods: life cycles, breeding habits, biology related to disease causation / disease transmission Self-learning packages + Videos Journal club	5	12

Duration of module 3 weeks
Direct contact hours Lectures 15 h /
Lab classes / tutorials 38 h

MODULE 8 - SEXUALLY TRANSMITTED INFECTIONS

Learning objectives
At the end of this module, trainees should be able to:

1. Describe the aetiology and the basic clinical features of syphilis, gonorrhoea, and HIV infection
2. Describe and perform the basic laboratory screening tests for the above infections

Learning activities

Learning content	Activity	Time
Syphilis: introduction, aetiology and laboratory diagnostic tests	Lecture	3 h
Serological tests for syphilis	Lab classes	8 h
Gonorrhoea: introduction, aetiology, laboratory diagnosis	Lecture	3 h
Gonorrhoea: microscopy and culture	Lab classes	8 h
HIV / AIDS: Introduction, aetiology, laboratory diagnostic tests	Lecture	4 h
Screening tests for HIV	Lab classes	8 h

Duration of module: 2 weeks
Direct contact hours: Lectures: 10 h
Lab classes / tutorials 24 h

MODULE 9 - MOLECULAR BIOLOGY

Learning objectives
At the end of this module, trainees should be able to:

1. Define the terms and outline the principles of molecular techniques used in molecular biology.
2. Outline the important applications of molecular techniques in diagnostic microbiology.
3. Describe the materials (reagents) and general methods used in molecular biology.
4. Outline the procedures for sample collection, transport and storage of clinical specimens for nucleic acid based diagnostic tests.
5. Describe how samples are prepared for nucleic acid based diagnostic tests.

Learning content	Activity	Time
1. Introduction to molecular biology Structure of nucleic acids; DNA, RNA and the genetic code; transcription, translation and replication Molecular biology and its impact on the practice of medicine Nucleic acid techniques in diagnostic microbiology	Lecture	1 h
2. General materials and methods used in molecular biology Reagents, de-ionised water; standard agarose gel electrophoresis	Lab classes (demo)	12 h
3. Sample preparation Isolation / culture & amplification of organisms Extraction and purification of DNA & RNA from clinical specimens and cDNA synthesis; extraction of nucleic acids from cultured specimens	Lab classes (demo)	12 h
4. Genetic engineering and cloning DNA Restriction endonucleases & ligases; techniques of DNA cloning Plasmid and bacteriophage vectors; expression of cloned DNA in vector systems; DNA sequencing	Lecture	2 h
5. Detection of specific nucleic acid sequences Preparation of DNA probes; labelling of DNA probes; preparation of RNA probes; dot & slot blotting; Southern blot hybridization	Lecture	2 h
6. Restriction fragment length polymorphism analysis Restriction digestion; preparation of cDNA probes	Lecture	1 h
7. *In situ* hybridisation Theory & general principles; sample preparation; detection of DNA & RNA in wax embedded tissue; detection of DNA in frozen sections	Lecture	1 h
8. Nucleic acid amplification *In vivo* culture enrichment; *in vitro* – Polymerase Chain Reaction; methodology of PCR; technical problems; sources of target nucleic acid contamination; quality control of PCR based detection methods; applications of PCR technology in Microbiology	Lecture	1 h
9. Current applications in medical microbiology Virology; bacteriology; parasitology; immunology	Lecture	1 h
10. Other applications of molecular biology in medicine Analysis of forensic evidence; genetic screening; gene therapy	Lecture	1 h

Duration of module: 2 weeks
Direct contact hours: Lectures: 10 h
Lab classes / tutorials: 24 h

MODULE 10 - CLINICAL MICROBIOLOGY

Learning objectives

At the end of this module, trainees should be able to manage a Microbiology laboratory by carrying out the following tasks:

1. Participate in the daily generation and checking of reports
2. Supervise the daily work of the MLTT by reading all culture plates with them

3. Interpret clinical information for laboratory staff and participate in decision regarding significant isolates, choice of antibiotics for ABST and further identification of isolates
4. Notify positive blood cultures and other critical results to medical staff

Learning activities

Learning content	**Activity**	**Time**
Specimen collection and transport	Lecture	2
Specimen reception, handling and documentation	Tutorial	12 h
Sample processing by system	Lecture	6
Preparation and quality control of media and reagents	Lecture	2
Practicals	Lab classes	12 h

Duration of module: 2 weeks

Direct contact hours: Lectures 10 h
Lab classes/tutorials 24 h

ANNEX 1
LIST OF TRAINING CENTERS

1. Faculty of Medicine, University of Ruhuna
2. Faculty of Medical Sciences, University of Sri Jayewardenepura
3. Faculty of Medicine, University of Colombo
4. Medical Research Institute
5. Colombo South Teaching Hospital, Kalubowila
6. National Hospital of Sri Lanka, Colombo
7. Sri Jayewardenepura General Hospital
8. Colombo North Teaching Hospital, Ragama
9. Faculty of Medicine, University of Peradeniya
10. Lady Ridgeway Hospital for Children, Colombo
11. Medical Research Institute
12. STD /AIDS Control Programme, Colombo
13. Ratnapura General Hospital
14. Cancer Institute, Maharagama
15. Chest Hospital, Welisara
16. Kurunegala General Hospital
17. Teaching Hospital, Galle
18. Faculty of Medicine, Kotelawala Defense University
19. National Institute of Health Sciences, Kalutara
20. Badulla General Hospital
21. Faculty of Medicine, University of Kelaniya

ANNEX 2
DIPLOMA MEDICAL MICROBIOLOGY PORTFOLIO
DIPLOMA MEDICAL MICROBIOLOGY TRAINING PROGRAMME

ASSESSMENT BY PORTFOLIO

INTRODUCTION:
The purpose of developing a portfolio is to make a trainee reflect on the process of training and professional development as a clinical Microbiologist. It should be composed of a series of documents that record this process.

OBJECTIVES
The trainees have
1. Used a wide and appropriate range of learning methods effectively to develop their knowledge, skills and attitudes in Microbiology.
2. Reflected on their own personal and professional practice and development, assessed their future development needs and made plans for continuing professional development
3. Developed personal and professional strategies appropriate to the constraints and opportunities of their working environment.
4. Evaluated their own work with self, peer and supervisor based monitoring and evaluation techniques.
5. Designed methods and techniques to improve the practice of diagnostic and clinical Microbiology in hospitals.
6. Provided support to the colleagues, peers and allied staff in providing training in Microbiology
7. Performed effectively in supporting the administrative tasks of the training unit.
8. Shown a commitment to work with and learn from colleagues, practiced equal opportunities and continued reflection on professional practice.

1/ An introduction to self; in the 1st person
- Who you are?
- Where do / did you work? (Present and past)
- Current work place - special interests you may have regarding your specialty.

2/ Statement about your mission and vision as a Medical Microbiologist
- Duties and responsibilities as a trainee in Microbiology.
- Your vision of a professional career in Microbiology.

3/ Records of activities and practices that you have undertaken as a Diploma trainee in Microbiology to achieve the objectives mentioned above

A. Record of training appointment:
This should include **a report** that documents what you hoped to achieve at the beginning of the hospital based appointment, and how much of this you had achieved by the end. The report should include in addition a self-evaluation carried out mid-way during the appointment that reviews your achievements to date, identifies problems that prevent you from reaching your goals, and what you plan to do to correct these deficiencies.

B. ***Direct observation of practical skills (DOPS)***

A minimum of *3* practical skills should be assessed during the taught course or hospital based training period. A description of the procedure together with the formative assessment in the structured format should be included in the portfolio.

C. Other reports that can be included in the portfolio :

- Descriptions of ward rounds performed during the hospital based training appointment, as well as participation in infection control and other relevant hospital committees.
- Description of teaching commitments undertaken by you during your training
- Reports on presentations you have made at journal clubs, lectures, etc, and feedback received from peers or supervisors on such presentations.
- Case records of patients that trainees have discussed with the trainer during their hospital training.

Board of study in Microbiology - Post Graduate Institute of Medicine

WORKPLACE- BASED ASSESMENT FORM
MEDICAL MICROBIOLOGY
Direct observation of practical skills (DOPS)

Trainee's name:	
Assessor's name	

Brief outline of procedure, indicating focus for assessment (Refer to topics in curriculum). Tick category of procedure or describe in space available.	

☐ Sample handling & preparation ☐ Microscopy and staining ☐ Identification ☐ Safe disposal
☐ Ability to separate mixed cultures to get pure culture ☐ Use of selective media
☐ Antimicrobial susceptibility testing ☐ Serology ☐ Molecular methodologies
(Setting up, reading and interpretation)

Other (specify)

Specimen

☐ Blood culture ☐ CSF ☐ Tissue ☐ Bone/joint aspirate ☐ Wound ☐ Respiratory ☐ Genital ☐ Faeces
☐ Urine ☐ Serum/ serology ☐ Serum/ blood level

Other (specify)

Complexity of procedures		Low		Average		High

	Please grade the following areas using the scale provided. This should relate to the standard expected for the end of the appropriate stage of training:	Below expectations	Borderline	Meets expectation	Above expectation	Unable to comment
		1	**2**	**3**	**4**	
1	Understands the scientific principles of the procedure, including the basic biology underpinning it					
2	Complies with health and safety requirements: Safe lab practise, standard precautions, hazard group, containment levels, safe disposal, etc					
3	Has read and understands the appropriate SOP					
4	Understands the principles of internal and external quality control associated with the test					
5	Is aware of the limitations of the test					
6	Overall technical ability and correct use of equipment					
7	Overall ability to perform procedure					
8	Communication of results (written and verbal reports), including report validation					
9	Is aware of importance of patient/ specimen identification checks & appropriate documentation					

PLEASE COMMENT TO SUPPORT YOUR SCORING

SUGGESTED DEVELOPMENTAL WORK:
(particularly areas scoring 1-3)

Outcome **Satisfactory** **Unsatisfactory**
(Please circle as appropriate)

Date of assessment:

Signature of Assessor

Signature of Trainee:

ANNEX 3

FORMAT FOR PROGRESS REPORT ON TRAINEES

To be sent at end of the 5 month in service hospital based clinical training,
to Coordinator Diploma in Medical Microbiology

Name of trainee:

Name of trainer:

Training centre:

Period of report:

Please use the following key to rate your trainee's performance during the period in question, with regard to each of the areas listed below

Outstanding	A
Above average	B
Adequate	C
Below expected	D

PRACTICAL SKILLS	**Rating**	**Specific comments**
A. Clinical judgement		
1. Assessment of request forms		
2. Selection of appropriate laboratory investigations		
B. Bench skills		
1. Preparation of reagents & media		
2. Hands-on work at the bench		
3. Interpretation of results		
C. Record keeping		

PROJECTS OR OTHER ACTIVITIES CARRIED OUT DURING THE PERIOD OF TRAINING:

INTERPERSONAL SKILLS	Rating	Specific comments
1. Communication & working with others in the lab		
2. Communication & working with persons of other disciplines		
3. Supervising & helping juniors and willingness to serve when required		
4. Following instructions of senior colleagues		
5. Power of expression (oral and written)		
7. Standard of punctuality, ethics, professional attitudes and reliability		
8. Teaching medical students and juniors		

ACADEMIC SKILLS	Rating	Specific comments
1. Theoretical background and knowledge		
2. Reads widely in medical literature		
3. Participates actively in academic discussions		
4. Thinks independently and rationally		

GENERAL COMMENTS

Particular strengths

Particular weaknesses

…… …… …… ……

Signature of trainer **Name** **Date**

ANNEX 4
MARKING GRID FOR THE ASSESSMENT OF PORTFOLIO SUBMITTED FOR DIPLOMA IN MEDICAL MICROBIOLOGY

YEAR

CANDIDATE NAME/INDEX NO.

Area	**Maximum mark**
Timely submission	**5**
Complete with minimum criteria	**5**
Introducing oneself	**5**
Mission and vision as a medical microbiologist	**5**
1. Used a wide and appropriate range of learning methods effectively to develop their knowledge, skills and attitudes in Microbiology.	**5**
2. Reflected on their own personal and professional practice and development, assessed their future development needs and made plans for continuing professional development	**5**
3. Developed personal and professional strategies appropriate to the constraints and opportunities of their working environment .	**5**
4. Evaluated their own work with self, peer and supervisor based monitoring and evaluation techniques.	**5**
5. Shown a commitment to work with and learn from colleagues, practiced equal opportunities and continued reflection on professional practice.	**5**
Record of training appointment	**10**
DOPS 1	**10**
DOPS 2	**10**
DOPS 3	**10**
commitment to reflective practice	**10**
Presentation, originality , organization, innovativeness	**5**
	100
Mark out of 10	**10**