CURRICULUM/SYLLABUS & REGULATIONS

MD INFECTIOUS DISEASES

PROGRAM

RAWALPINDI MEDICAL UNIVERSITY, RAWALPINDI
STATUTES

Nomenclature Of The Proposed Course

The name of degree Program shall be MD Infectious diseases. This name is well recognized and established for the last many decades worldwide.

Course Title:

MD Infectious Diseases

Training Centers

Department of Infectious diseases Holy Family Hospital, RMU and Allied Hospitals, Rawalpindi.

PREFACE

The horizons of Medical Education are widening & there has been a steady rise of global interest in Post graduate Medical Education, an increased awareness of the necessity for experience in education skills for all healthcare professionals and the need for some formal recognition of postgraduate training in Internal Medicine.

We are seeing a rise in the uptake of places on postgraduate courses in medical education, more frequent issues of medical education journals and the further development of e-journals and other new online resources. There is therefore a need to provide active support in Post Graduate Medical Education for a larger, national group of colleagues in all specialties and at all stages of their personal professional development. If we were to formulate a statement of intent to explain the purpose of this log book, we might simply say that our aim is to help clinical colleagues to teach and to help students to learn in a better and advanced way. This book is a state of the art log book with representation of all activities of the MD/MS Research Elective program at RMU.A summary of the curriculum is incorporated in the logbook for convenience of supervisors and residents. It also allows the clinicians to gain an understanding of what goes into basic science discoveries and drug development. Translational research has an important role to play in medical research, and when used alongside basic science will lead to increased knowledge, discovery and treatment in medicine. A perfect monitoring system of a training program including monitoring of teaching and learning strategies, assessment and Research Activities cannot be denied so we at RMU have incorporated evaluation by Quality Assurance Cell and its comments in the logbook in addition to evaluation by University Training Monitoring Cell (URTMC). Reflection of the supervisor in each and every section of the logbook has been made sure to ensure transparency in the training program. The mission of Rawalpindi Medical University is to improve the health of the communities and we serve through education, biomedical research and health care. As an integral part of this mission, importance of research culture and establishment of a comprehensive research structure and research curriculum for the residents has been formulated and a separate journal for research publications of residents is available.

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CONTENTS

DEPARTMENT OF INFECTIOUS DISEASES

The department of infectious diseases was conceived in 2013, through the vision of the worth Vice Chancellor, to fill in the infectious diseases void in Pakistan. The department was the first dedicated public sector infectious diseases department in Pakistan. The department has since then been dealt with many diseases in Pakistan, such as dengue fever, Crimean Congo hemorrhagic fever, seasonal influenza (H1N1), Rabies, Tetanus, measles, Chicken pox, etc. Recent epidemics of Dengue fever in Punjab accentuated the need and urge for establishment of a state of art, purpose built department of infectious disease that could cater to the effected population of Rawalpindi, through provision of quality health services including accurate and timely diagnosis, efficient management, rehabilitation, in addition to strict control and containment of infection. The department not only provides clinical management and care to patients, but is actively involved in training, research and development of guidelines. The department is currently running 3 training programs, dengue clinical management infection control for nursing and epidemiology, Clinical management and prevention of COVID-19. The department has trained over 300 nurses and doctors to date, with regards to these training programs.

During the epidemic of COVID-19, the Department of Infectious diseases stepped up once more and took charge of the situation. The Department designed standers detailing proper donning/doffing techniques, prevention and safe practice techniques, social distancing and info graphics on the disease. The dedicated files, patient registrations forms, infection control guidelines, patient clinical care guidelines were all

developed by the Department of Infectious Diseases, well before the onset of the pandemic in Pakistan.

Department of infectious disease is located in basement of Holy Family Hospital which is a tertiary care hospital, part of RMU and Allied Hospitals.

FACILITIES

A. IN PATIENT:

- Total Number of beds: 70
- Male: 35 Female: 35
- No. of High Dependency beds in the Unit: 10
- No. of beds (absolute /dedicated) in main intensive care unit (available for use by the unit): 2
- In case of Epidemic of infection Dengue the bed strength can be extended to 180
- Isolation ward facility for patient with infection diseases

B. EQUIPMENTS AVAILABLE IN DID:

S. No.	***Equipment Name***	***Number***
1.	Oxygen Supply	70
2.	Monitor	20
3.	Suction Machine	04
4.	Glucometer	10
5.	E.C.G Machine	02
6.	Nebulizer	10
7.	Defibrillator	02
8.	Synge Pump	02
9.	Infusion Pump	04
10.	Ventilator	03
11.	Sphygmomanometers	30
12.	Portable X ray Machine	01

C. OUTPATIENT

- To perform scheduling tests, appointments, retrieving records and letters.

D. SUPPORT SERVICES

- The program related to infectious diseases will be conducted in collaboration in other clinical departments

E. MEDICAL RECORD

- Medical record of every patient is properly maintained as per hospital policy.

AMBULATORY CARE FACILITIES

There are two outpatient departments of DID, one located in vicinity of DID department and second in the main OPD complex of HFH hospital. The subspecialty resident has one clinic per week from 8:00am – 02:00pm. The clinic consists principally for conducting outpatient follow-up visits on patients previously hospitalized, for the management of patients on home IV antibiotic, or for the management of HIV infected persons.

In addition, new consultations are seen in these clinics. The subspecialty resident will attend approximately 50 outpatient clinics per year.

The subspecialty residents have primary responsibility for the ambulatory care of Infectious Diseases Clinic patients and hospital follow-up visits. They are always supervised by an attending physician in Infectious Diseases who will review the care and sign off on each patient visit. It is expected that the subspecialty residents will make the majority of decisions, with difficult decisions made in consultation with the attending physician.

Continuity of care is provided by arranging for subspecialty residents in Infectious Diseases to maintain an outpatient clinic for the follow-up of patients who were previously evaluated and treated on the inpatient service. This outpatient clinic is maintained throughout the Subspecialty Residency Training. This experience includes the continuous management of patients with all stages of HIV infection over a 24 month period.

MD INFECTIOUS DISEASES

PROGRAM

INTRODUCTION

Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another. Zoonotic diseases are infectious diseases of animals that can cause disease when transmitted to humans.

Infectious diseases are one of the leading causes of morbidity and mortality throughout the world especially in developing countries like ours. Amongst all clinical specialties, the infectious diseases department has to be the most vigilant, efficient, organized and active to timely deal with multidisciplinary nature of the infections and not only to treat it but also restrict and confine it.

The program is structured under the ACGME guidelines July 2020 and is equipped with all available resources and infrastructure to manage the infectious diseases and epidemic threats and has High Dependency Unit, Isolation rooms and general wards to managed the patients related to Infectious Diseases.

The course is focused to give full information to the resident related to Infectious Diseases and all the commonly prevalent infectious diseases of this region with special emphasis on Dengue and COVID-19 these years and also the rare or sporadic infections including Ebola, Anthrax, MERS, and SARS etc. Although DID is currently in inception phase, it is thought that continuous efforts will help to make it an exemplary unit in near future. Audits and research focusing infectious diseases treatment in our own scenario will in the long term help in better management of these diseases.

AIMS AND OBJECTIVES OF THE PROGRAM

AIMS

The aim of five years MD Program in Infectious diseases is to train residents to acquire the competency of a specialist in the field of Infectious diseases so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

GENERAL OBJECTIVES

MD Infectious diseases training will enable a resident to:

1. Overall assessment of patient care that is effective, safe, timely, efficient, equitable and patient-centered.
2. Medical knowledge about established and evolving biomedical, clinical and cognate sciences (e.g., epidemiological and social-behavioral) and the application of this knowledge to patient care.
3. Interpersonal and communication skills that result in effective information exchange and teaming with patient, their families and other health professionals.
4. Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population, providing cost-effective, ethical and humanistic care.
5. System-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.
6. Practice-based learning and improvement that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence and improvement in patient care.
7. To incorporate interpersonal and communication skill in the training that result in effective exchange of information and collaborate with the patient, families and Health professionals.
8. To create an awareness of an responsiveness to larger contexts and system of health care, including the social determinates of health as well as the availability to call effectively or other resources to provide optimal healthcare.

LENGTH OF EDUCATION PROGRAM

The duration of MD Infectious diseases program shall be five (5) years for Residents who have no past internship experience in internal medicine and 2 years for fellows who have certificate of successful completion of FCPS/MD in internal medicine with structured training in a recognized department under the guidance of an approved supervisor. The program is structured as follows:-

After admission in MD Infectious disease Program of RMU resident will spend first 6 Months in Department of Infectious disease as **Induction period** during which resident will get orientation about the chosen discipline and will also undertake the **mandatory workshops;**

1. Research Methodology and biostatistics
2. Synopsis Writing
3. Communication Skills
4. Introduction to Computer/Information Technology and Software Program

The research project will be designed and the **synopsis** be prepared during this period. On completion of Induction period the resident will start formal training in the Basic Principles of Internal Medicine for 24 Months (2 years). During this period the resident must get the research synopsis approved. At the end of 30 months (2.5 years), the candidate will take up Intermediate Examination.

Residents who have entered the program after successful completion of FCPS/MD internal medicine will be exempted from first 30 months.

After the intermediate examination till the end of program, there will be two components of the training.

1. Clinical training in Infectious Diseases (24 months)
2. Research and thesis writing (6 months)

The candidate shall undergo clinical training to achieve educational objectives of MD Infectious diseases (knowledge & Skills) along with rotation in the relevant fields, which will be carried out during the clinical training period in infectious diseases. The clinical training will be competency based. There will be generic and specialty specific competencies and shall be assessed by continuous Internal Assessment.

The Research Component and thesis writing shall be completed over the five years duration of the program. The Candidate will spend total time equivalent to 6 months for research during the training. Research can be done as one block or it can be done in the form of regular periodic rotation over five years as long as total research time is equivalent to 6 months.

ELIGIBILITY CRITERIA

Applications for admission to MD Training Programs of Infectious Diseases will be invited through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination.

Eligibility: The applicant on the last date of submission of applications for admission must possess the:

i. Basic Medical Qualification of MBBS or equivalent medical qualification recognized by Pakistan Medical & Dental Council.
ii. Certificate of one year's House Job experience in institutions recognized by Pakistan Medical & Dental Council is essential at the time of interview. The applicant is required to submit Hope Certificate from the concerned Medical Superintendent that the House Job shall be completed before the Interview.

iii. Valid certificate of permanent or provisional registration with Pakistan Medical & Dental Council.

iv. Applicants who are opting infectious disease as second fellowship must have certificate of successful completion of FCPS/MD in internal medicine.

Admission will be made through Rawalpindi Medical University policy as per Government of the Punjab rules.

REGISTRATION AND ENROLLMENT

- As per policy of Pakistan Medical & Dental Council the number of residents per supervisor shall be maximum 05 per annum for all PG programs including minor programs (if any).
- Beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.
- The University will approve supervisors for MD program.
- Candidates selected for the program after their enrollment at the relevant institutions shall be registered with RMU as per prescribed Registration Regulations.

METHODS OF INSTRUCTION/PROGRAM CONDUCTION

As a policy, active participation of students at all levels will be encouraged. Following teaching modalities will be employed:

1. Lectures
2. Seminar Presentation and Journal Club Presentations
3. Group Discussions
4. Grand Rounds
5. Clinico-pathological Conferences
6. SEQ as assignments on the content areas
7. Skill teaching in ICU, emergency and ward settings
8. Attend genetic clinics and rounds for at least one month.
9. Attend sessions of genetic counseling
10. Self-study, assignments and use of internet
11. Bedside teaching rounds in ward
12. OPD & Follow up clinics
13. Long and short case presentations

In addition to the conventional teaching methodologies interactive strategies like conferences will also be introduced to improve both communication and clinical skills in the upcoming consultants. Conferences must be conducted regularly as scheduled and attended by all available faculty and residents. Residents must actively request autopsies and participate in formal review of gross and microscopic pathological material from patients who have been under their care. It is essential that residents participate in planning and in conducting conferences.

1. Clinical Case Conference

Each resident will be responsible for at least one clinical case conference each month. The cases discussed may be those seen on either the consultation or clinic service or during rotations in specialty areas. The resident, with the advice of the

Attending Physician on the Consultation Service, will prepare and present the case(s) and review the relevant literature.

2. Monthly Resident Meetings

Each affiliated department will provide a room for resident meetings/discussions such as:

a. Journal Club Meeting
b. Core Curriculum Meetings
c. Skill Development

a. Journal Club Meeting

A resident will be assigned to present, in depth, a research article or topic of his/her choice of actual or potential broad interest and/or application. Two hours per month should be allocated to discussion of any current articles or topics introduced by any participant. Faculty or outside researchers will be invited to present outlines or results of current research activities. The article should be critically evaluated and its applicable results should be highlighted, which can be incorporated in clinical practice. Record of all such articles should be maintained in the relevant department.

b. Core Curriculum Meetings

All the core topics of Infectious diseases should be thoroughly discussed during these sessions. The duration of each session should be at least two hours once a month. It should be chaired by the chief resident (elected by the residents of the relevant discipline). Each resident should be given an opportunity to brainstorm all topics included in the course and to generate new ideas regarding the improvement of the course structure

c. Skill Development

Two hours twice a month should be assigned for learning and practicing clinical skills.

List of skills to be learnt during these sessions is as follows:

1. Residents must develop a comprehensive understanding of the indications, contraindications, limitations, complications, techniques, and interpretation of results of those technical procedures integral to the discipline.
2. Residents must have instruction in the evaluation of medical literature, clinical epidemiology, clinical study design, relative and absolute risks of disease, medical statistics and medical decision making.
3. Training must include cultural, social, family, behavioral and economic issues, such as confidentiality of information, indications for life support systems, and allocation of limited resources.
4. Resident must be taught the social and economic impact of their decisions on patients, the primary care physician and society. This can be achieved by attending the bioethics lectures and becoming familiar with Project Professionalism Manual such as that of the American Board of infectious diseases.
5. Resident should have instruction and experience with patient counseling skills and community education
6. This training should emphasize effective communication techniques for diverse populations, as well as organizational resources useful for patient and community education.
7. Resident should have experience in the performance of clinical laboratory and radionuclide studies and basic laboratory techniques, including quality control quality assurance and proficiency standards.
8. Each resident will observe and participate in each of the procedures, preferably done on patients first under supervision and then independently.

Annual Grand Meeting

Once a year all resident enrolled for MD infectious disease should be invited to the annual meeting at RMU Rawalpindi.

One full day will be allocated to this event. All the chief residents from affiliated institutes will present their annual reports. Issues and concerns related to their relevant courses will be discussed. Feedback should be collected and suggestions should be sought in order to involve resident in decision, making.

The research work done by residents and their literary work may be displayed.

In the evening an informal gathering and dinner can be arranged. This will help in creating a sense of belonging and ownership among students and the faculty.

CLINICAL EXPERIENCE AND EDUCATION

Maximum hours of clinical and educational work per week

- 80 hours per week (maximum hours include all the clinical and educational activities)

Mandatory time free of clinical work and education

- The program should be structured in a way so that resident can have reasonable opportunity for rest and personal well-being.
- Resident should have 8 hours of between scheduled clinical work and education period.
- Resident must be schedule for a minimum of one day in seven free of clinical work and required education.
- Maximum clinical work and education period length should not exceed 24 hours of continuous schedule clinical assignment.

SPECIFIC LEARNING OUTCOMES
MD INFECTIOUS DISEASES

Objectives

A. Specific objectives of the Clinical Infectious Diseases Trainee

- Acquire an advanced understanding of host defense mechanisms and immune responses in relation to infectious diseases
- Acquire an advanced understanding of the etiology, pathogenesis, diagnosis and therapy of patients with human immunodeficiency virus infections and associated opportunistic infections.
- Acquire an advanced understanding of the etiology, incidence, and predisposing factors of nosocomial infections including the management and maintenance of indwelling vascular catheters.
- Acquire an advanced understanding of infections in special hosts (transplant recipients, neutropenia patients and HIV infected patients).
- Acquire an advanced understanding of anti-infective therapy including susceptibility testing, resistance mechanisms, pharmacodynamics and pharmacokinetics.
- Acquire an advanced understanding of toxins and virulence factors of infectious agents.
- Acquire an advanced understanding of the principles and use of vaccines.
- Acquire a basic understanding of the principles and methods of epidemiology in relationship to infectious diseases.
- Acquire a basic understanding of medical ethics in medical practice and research.
- Acquire a basic understanding of the use of statistics in medical practice and research.
- Acquire an advanced understanding of infectious agents that have potential use for bioterrorism.
- Acquire training in system-based medical practice.
- Acquire an advanced understanding of the etiology, pathogenesis, diagnosis, and therapy of patients with the following infectious diseases problems:

1. Tuberculosis
2. HIV/AIDS
3. Vector borne diseases
4. Bacterial infection
5. Hepatitis
6. COVID-19
7. Fungal infection
8. Parasitic infection
9. Viral infection
10. Healthcare associated infection
11. Infection in patient in ICU
12. Infection in patient in immunocompromised
13. Infection in surgical patients
14. Infection in travelers
15. Fever of unknown origin
16. Fever associated with skin rash
17. Sexually transmitted diseases and diseases of the reproductive tract
18. Sepsis and shock syndromes
19. Pain management including recognition of signs of addiction

B. Specific Objectives of the Research Infectious Diseases Trainee

- Formulate hypothesis for the selected research proposal.
- Develop methods specific to the research plan, including assessment of the necessary laboratory tests, groups of animals, or number of patients using statistical methods.
- Understand procedures for obtaining Institutional Review Board approval by human studies committee if applicable.
- Become proficient in laboratory assays required in the research proposal.
- Analysis of the data including computer programs, statistical methods, and tabular and illustrative graphs.
- Formulate the analyzed data into abstract or manuscript form for presentation and publication.
- Understand ethical issues of human and animal research.

CORE CURRICULA OF MD INFECTIOUS DISEASES PROGRAM

Knowledge areas:

Fundamental Principles

1. Microbial virulence factors
2. Host defense mechanisms
3. Epidemiology of infectious diseases
4. Anti-infective therapy – principles

Approach to Clinical Microbiology

1. Appropriate collection and transport of specimens
2. Sterilization and disinfection
3. Microscopy
4. Staining (Gram, AFB, others)
5. Culture media and basic preparation
6. Culture techniques (standard and automated)
7. Bacterial and mycobacterial microbiology
8. Sensitivity testing
9. Parasitology
10. Mycology
11. Molecular diagnostics
12. Virology
13. Safety
14. Quality assurance

Management of Major Infectious Clinical Syndromes

1. Fever evaluation
2. Respiratory tract infections
3. Cardiovascular infections
4. Central nervous system infections
5. Skin and soft tissue infections

6. Gastrointestinal infections, food poisoning and hepatitis
7. Bone and joint infections
8. Diseases of the reproductive organs and sexually transmitted diseases
9. Eye and ENT infections
10. Infections in other organ systems
11. Acquired immunodeficiency syndrome
12. Infections in immune compromised hosts and burns
13. Transplant infections
14. Nosocomial infections
15. Infections in special hosts
16. Surgical and trauma-related infections
17. Zoonoses
18. Miscellaneous syndromes

Specific Pathogens

1. Viral diseases and Prions
2. Chlamydial and Mycoplasma diseases
3. Rickettsioses and ehrlichioses
4. Bacterial diseases
5. Mycoses
6. Protozoal diseases
7. Diseases due to toxic algae
8. Diseases due to Helminths and ectoparasites

Special Topics

2. Immunization
3. Infection control
4. Risk reduction
5. Outbreak investigation
6. Travel medicine
7. Biological warfare
8. Health economics

9. Use of information resources
10. Biostatics
11. Evaluation of literature
12. Medical writing and funding sources
13. Medical ethics

Diagnostics – exposure to be embedded in clinical rotations

- Interpretation of radiology and nuclear medicine techniques in consultation with specialists in those areas
- Interpretation of pathologic diagnoses relevant to infections and inflammation in consultation with pathologists

INFECTIOUS DISEASES SYLLABUS OVERVIEW

SR#		AIMS/ OBJECTIVES	LEARNING OUTCOMES
1.	**Principles of Biology**	Fundamentals of biological principles and the evolutionary tree of life, molecular biology and biochemistry; cell biology and immunology and vaccinology.	Residents should be able to: • Discuss the basic features of prokaryotic and eukaryotic cells and, at a basic level, the evolutionary relationships between the main kingdoms. • Explain the characteristics and roles of the basic molecules of life and demonstrate an understanding of the biochemistry that governs their interactions. • Describe the structure of different types of cells and explain the relationships between these structures and the specialized functions of cells and their components. • Discuss the main cell types, molecules and processes involved in the immune response and demonstrate how the various components act together to provide immunity to infection.
2.	**Biology of Infectious Diseases**	Introduction to the way pathogens (viruses, bacteria, fungi, protozoa, helminths) invade, establish, cause disease and evade the immune response in the vertebrate host.	Residents should be able to: • Distinguish between the different relationships that exist between pathogens and their human hosts. • Give examples of pathogens (viruses, bacteria, fungi, protozoa and helminths) that cause the most important communicable diseases in humans. Explaining how the host responds to infections and how pathogens cause disease. • Discuss the concept of vectors with particular reference to insects and acarines, including examples of transmitted pathogens. • Assess how knowledge of the relationship between pathogens, vectors and their hosts can be used to reduce the global burden of communicable diseases.
3.	**Principles of Biostatistics and Epidemiology**	Introduction of epidemiology and statistics.	Residents should be able to: • Use and interpret different types of data in medical research. • Demonstrate by the use of some simple statistical tests, the role of statistics in medical research. • Understanding of the role of power calculations in planning studies, by using them to determine the number of participants required for a given study.

			• Discuss the principles of epidemiology and relate these to the decision making processes in public health.
4.	**Control of Infectious Diseases**	Introduction to public health, methods for the control of infectious diseases, surveillance methods, and the design of control programs, with the aim that residents will be able to follow essential arguments in reports and articles written about issues in these topical areas, and to understand the principles for designing public health intervention programs.	Residents should be able to: • Show familiarity with, and understanding of, some key concepts in public health. • Make effective use of the academic literature on surveillance and methods for the control of infectious diseases. • Demonstrate an awareness of the breadth of issues relevant to the control of infectious disease, from food hygiene to social inequality. • Relate some of the intellectual history of efforts to control disease and show a conceptual understanding of the evolutionary nature of public health problems. • Use the fundamental principles of program design to understand how to design a control program for an infectious disease problem
5.	**Bacterial Infections**	To understand of the biology of bacteria as pathogens. Focus on the major bacterial diseases and other important types of bacterial infection, urinary tract infection and perinatal infection. The infections will be considered in groups related to the body systems infected.	Residents should be able to: • Develop a strategy to deal with the study of bacterial infection, • If presented with infected patients, know which clinical samples might be collected, • If presented with clinical samples, know which laboratory investigations might be appropriate, • If presented with bacterial cultures from clinical samples, know what investigations to carry out and why
6.	**Viral Infections including COVID-19**	To undertake a systematic overview of the important viruses causing infections in humans. Explore the molecular biology of the different types of viruses, the different strategies that are involved in their replication and the ways in which they cause disease. Consideration to the prevention, treatment and control of virus infections. Prior knowledge of basic biochemistry, cell biology, genetics and immunology from core modules or elsewhere.	Residents should be able to: • Distinguish the different classes of viruses on the basis of their genome and identify the main features of each virus. • Describe the mechanisms used by viruses to infect the cells and discuss clearly each step of virus replication. • Discuss the pathological aspects of virus infection related to specific virus families. • Recognise the role and the impact that some viruses have on public health (i.e. COVID-19, HCV, HBV, HIV-1 and oncogenes). • Discuss the different approaches used for the prevention and treatment of viral infection including vaccines and antiviral chemotherapies.
7.	**Parasitology**	To understand biology of parasites, vectors and the ways	Residents should be able to: • Describe and explain details of the

		in which they can cause disease. The organisms responsible for the major parasitic diseases will provide the main focus for instruction as they have also been the main focus for research.	development and transmission of the major parasite pathogens, • Describe and explain how their complex life cycles cause the clinical and pathological conditions that constitute the disease. • Describe and explain the remarkable and diverse ways in which the parasites survive by evading the host response to them, • Describe, plan and critically assess attempts to control each infection by drug treatment, vaccination or by attacking vector or intermediate hosts that are essential to development of the parasite.
8.	**Tuberculosis**	To give students a broad understanding of TB control, with an emphasis on the biology and pathology of tuberculosis, and how modern techniques of molecular biology and immunology can be harnessed to combat an old plague.	Residents should be able to: • Explain the biology of the tubercle bacillus and its interaction with its human host, • Describe the clinical features of tuberculosis, including its clinical manifestations, diagnosis and treatment among adults and children and including the effects of HIV, • Analyse the current approaches to tuberculosis control, • Evaluate the broader biological, social and ethical issues that relate to tuberculosis and measures for its control.
9.	**Vector borne diseases**	To give an introduction to parasites and their vectors, malaria as a disease, how it can be controlled and the factors that make it so difficult to control. Residents will learn about the successes that have been achieved and those that are likely in future. There is much that we still do not know about the malaria parasites, their vectors and the disease itself and each year, malaria research adds to the scientific and medical literature. We hope that this module will give you enough information to allow you to understand the literature on the subject and to assess it critically.	Residents should be able to: • Describe the malaria parasites and their vectors, and malaria as a disease, • Explain how malaria can be controlled using interventions that target the vector or the parasite, and the factors that make malaria difficult to control. • Understand the acquisition of anti-malarial immunity and the immunopathogenesis of the disease.
10.	**HIV/AIDS**	To give students a broad understanding of the HIV epidemic, and to equip them to analyse the appropriateness of alternative therapeutic and preventive intervention strategies in different settings.	Residents should be able to: • Understand the structure and behaviour of the virus, and its pathogenesis. • Describe the immune response to infection, and analyse the prospects for the development of an effective vaccine.

			• Review the approaches to diagnosis and the use of alternative case definitions of HIV/AIDS. • Compare the natural history of HIV and AIDS in different geographical settings. • Evaluate the appropriateness and effectiveness of prophylactic and therapeutic drug treatments in different settings, including the use of antiretroviral therapy. • Describe the modes of transmission of the virus, and characterize the regional epidemics of HIV in different parts of the world. • Understand the risk factors for HIV infection, and analyse how social, cultural, behavioural and biological factors interact to determine the transmission of the virus. • Evaluate the effectiveness of alternative strategies of HIV prevention. • implement effective HIV control programs that are tailored to the local context
11.	**Healthcare-associated infections/ Intensive Care Unit**	To give residents the necessary knowledge to be able to develop a strategy to prevent healthcare associated and hospital infections. If presented with infected patients, the students would know what clinical samples should be collected and how the information derived from them could be used to inform a strategy for the prevention of healthcare associated infection.	Residents should be able to discuss the: • Essential theory and practice of nosocomial infections, • Microbiological diagnosis and control of these infections, • Role of health care professionals in the surveillance and management of healthcare associated infections.
12.	**Immunology of Infection and Vaccines**	To provide an overview of modern molecular immunology methods and immunity to infection. Although not all aspects of immunology can be covered in depth, more detailed insight will be provided into selected aspects of current research of particular relevance to vaccine design.	Residents should be able to: • Describe the main immunological responses responsible for immunity to the selected pathogens and how these influence vaccine design, • Discuss evasion strategies of pathogens and problems they cause for vaccine design, • Understand the principles and uses of a range of immunological techniques in current use, • Read a scientific paper on the immunology of infection and understand how the findings support or contradict previously held theories.
13.	**Nutrition and Infection**	To understand of the interactions between nutrition and infections, and to deal with	Residents should be able to: • Contextualise discussions of nutrition and infection within historic and methodological

		the practical and operational management of infectious disease or under-nutrition at either the individual or population level.	frameworks, • Review the basic knowledge and understanding of immunological mechanisms of the human body and the role nutrients play in immune mechanisms, • Describe the role infection plays in the aetiology and pathogenesis of under-nutrition, • Explain how and why under-nutrition affects the host defence mechanisms and influences resistance to infection, • Identify the specific nutrients that influence the risk of infection, and review the evidence for this interaction between specific micronutrients and infections, • Describe the consequences of the vicious cycle of the relationship between infection and nutrition. • Understand that the field is positioned in between nutrition and immunology, and appreciate that knowledge, insights and concepts are rapidly developing and changing. Critical appraisal of literature and a good understanding of the basic principles of several disciplines need to be combined to understand the current concepts in this field, rather than just acquiring textbook knowledge.
14.	**Water, Sanitation and Hygiene**	To enable residents to understand the principles and practices that should underlie water, sanitation and hygiene (WASH) interventions, in order to maximize health and social benefits. The module also aims to empower students to contribute usefully to discussions with other professionals regarding health impacts, technology choice and policy aspects of water supply, excreta disposal and other environmental interventions affecting health in low and middle developing countries.	Residents should be able to: • Have a critical understanding of sanitation, water and hygiene interventions and of the ways in which such projects can impact on health in low income settings; • Be able to point out the principal pitfalls in health impact measurement, and suggest appropriate alternatives; • Be able to discuss the wider social, economic, institutional and environmental contexts of water, hygiene and sanitation strategies; • Appraise the existing evidence for the effectiveness of water, hygiene and sanitation interventions; • Have a basic understanding of the principles of behaviour change in the water, sanitation and hygiene sector and the pros/cons of alternative ways to measure behaviour change outcomes; • Have a basic understanding of the WASH products and services options available and the factors which guide choice of hardware;

			• Have a critical appreciation of the importance of behaviour change communications and demand promotion/creation strategies tailored to the target population in the planning,
15.	**Epidemiology and Control of Infectious Diseases in Developing Countries**	To provide epidemiological methods useful for the investigate of communicable diseases, to show how to use these methods to analyse a communicable disease, categorize control methods and evaluate their effectiveness facilitate the setting-up of control programs applicable to the type of communicable disease.	Residents should be able to: • Analyse communicable diseases and apply appropriate control methods to contain them. More specific objectives are to enable residents: • Apply epidemiological methods in the analysis of a communicable disease, • Understand the principles of control methods and know how to apply them, • Set up a control program and monitor progress.
16.	**Research Design, Management and Analysis**	To enable to develop and understand research projects and to give guidance to those of you who are carrying out a project as part of their MSc degree.	Residents should be able to: • Formulate a research question. • Perform a literature review. • Prepare a study protocol. • Identify strengths and weaknesses in research proposals. • Anticipate and manage problems in the evolution of research projects. • Present and disseminate research results effectively. • Organise your MSc dissertation. • Apply experimental approaches to the study of infections. • Use social sciences methods in the study of infectious diseases. • Explain how different approaches and study designs can be used and combined.

ROTATION SCHEME

After the induction period of 6 months, the resident will undergo training in Internal Medicine for next 24 months (including acquisition of clinical knowledge and skill in Gastroenology, Cardiology, Nephrology, Radiology and Transplant Unit). Than resident will report back to the parent department and will complete his mandatory rotations in Clinical Microbiology (2 months), Community Medicine (2 months) and Research Unit (2 months) in the part II of training period.

INTERNAL MEDICINE COMPETENCIES AND CLINICAL KNOWLEDGE

Resident should get exposure in the following organ and system competencies (listed below) while considering and practicing each system in terms of: -

- Medical ethics
- Professional values, student teachers relationship
- Orientation of in-patient, out-patients and cardiology labs
- Approach to the patient
- History taking
- General physical examination
- Systemic examination
- Routine investigations
- Special investigations
- Diagnostic and therapeutic procedures

Course Contents:

a. Respiratory Medicine

Common and / or Important Respiratory Problems:

- COPD
- Asthma
- Pneumonia
- Pleural disease: Pneumothorax, pleural effusion, mesothelioma
- Lung Cancer
- Respiratory failure and methods of respiratory support

- Pulmonary embolism and DVT
- Tuberculosis
- Interstitial lung disease
- Bronchiectasis
- Respiratory failure and cor-pulmonale
- Pulmonary hypertension

Clinical Science:

- Principles of lung function measurement
- Pharmacology of major drug classes: bronchodilators, inhaled corticosteroids, leukotriene receptor antagonists, immunosuppressants

b. Diabetes & Endocrine Medicine

Common and / or Important Diabetes Problems:

- Diabetic ketoacidosis
- Non-acidotic hyperosmolar coma / severe hyperglycaemia
- Hypoglycaemia
- Care of the acutely ill diabetic
- Peri-operative diabetes care

Common or Important Endocrine Problems:

- Hyper/Hypocalcaemia
- Adrenocortical insufficiency
- Hyper/Hyponatraemia
- Thyroid dysfunction
- Dyslipidaemia
- Endocrine emergencies: myxoedemic coma, thyrotoxic crisis, Addisonian crisis, hypopituitary coma, phaeochromocytoma crisis

Clinical Science:

- Outline the function, receptors, action, secondary messengers and feedback of hormones
- Pharmacology of major drug classes: insulin, oral anti-diabetics, thyroxine, anti-thyroid drugs, corticosteroids, sex hormones, drugs affecting bone metabolism

c. Gastroenterology and Hepatology

Common or Important Problems:

- Peptic Ulceration and Gastritis
- Gastroenteritis
- GI malignancy (oesophagus, gastric, hepatic, pancreatic, colonic)
- Inflammatory bowel disease
- Iron Deficiency anaemia
- Acute GI bleeding
- Acute abdominal pathologies: pancreatitis, cholecystitis, appendicitis, leaking abdominal aortic aneurysm
- Functional disease: irritable bowel syndrome, non-ulcer dyspepsia
- Coeliac disease
- Alcoholic liver disease
- Alcohol withdrawal syndrome
- Acute liver dysfunction: jaundice, ascites, encephalopathy
- Liver cirrhosis
- Gastro-oesophageal reflux disease
- Nutrition: indications, contraindications and ethical dilemmas of nasogastric feeding and EG tubes, IV nutrition, re-feeding syndrome
- Gall stones
- Viral hepatitis
- Auto-immune liver disease
- Pancreatic cancer

Clinical Science:

- Laboratory markers of liver, pancreas and gut dysfunction
- Pharmacology of major drug classes: acid suppressants, anti-spasmodics, laxatives, anti-diarrhea drugs, aminosalicylates, corticosteroids, immunosuppressants, infliximab, pancreatic enzyme supplements.

d. Cardiovascular Medicine

Common and / or important Cardiac Problems:

- Arrhythmias
- Ischaemic Heart Disease: acute coronary syndromes, stable angina, atherosclerosis
- Heart Failure
- Hypertension – including investigation and management of accelerated hypertension
- Valvular Heart Disease
- Endocarditis
- Aortic dissection
- Syncope
- Dyslipidaemia

Clinical Science:

- Physiological principles of cardiac cycle and cardiac conduction
- Pharmacology of major drug classes: beta blockers, alpha blockers, ACE inhibitors, Angiotensin receptor blockers (ARBs), anti-platelet agents, thrombolysis, inotropes, calcium channel antagonists, potassium channel activators, diuretics, anti-arrhythmics, anticoagulants, lipid modifying drugs, nitrates, centrally acting anti-hypertensives.

e. Renal Medicine

Common and / or Important Problems:

- Acute renal failure
- Chronic renal failure
- Glomerulonephritis
- Nephrotic syndrome
- Urinary tract infections
- Urinary Calculus
- Renal replacement therapy

- Disturbances of potassium, acid/base, and fluid balance (and appropriate acute interventions)

Clinical Science:

- Measurement of renal function
- Metabolic perturbations of acute, chronic, and end-stage renal failure and associated treatments

f. Immunology

Common or Important Problems:

- Anaphylaxis (see also 'Allergy')

Clinical Science:

- Innate and adaptive immune responses
- Principles of Hypersensitivity and transplantation

g. Haematology

Common and / or Important Problems:

- Bone marrow failure: causes and complications
- Bleeding disorders: DIC, haemophilia
- Thrombocytopaenia
- Anticoagulation treatment: indications, monitoring, management of over-treatment
- Transfusion reactions
- Anaemia: iron deficient, megaloblastic, haemolysis, sickle cell,
- Thrombophilia: classification; indications and implications of screening
- Haemolytic disease
- Myelodysplastic syndromes
- Leukaemia
- Lymphoma
- Myeloma
- Myeloproliferative disease
- Inherited disorders of haemoglobin (sickle cell disease, thalassaemias)

- Amyloid

Clinical Science:

- Structure and function of blood, reticuloendothelial system, erythropoietic tissues

h. Clinical Pharmacology

Common and / or Important problems:

- Corticosteroid treatment: short and long-term complications, bone protection, safe withdrawal of corticosteroids, patient counselling regarding avoid adrenal crises
- Specific treatment of poisoning with:
- Aspirin,
- Paracetamol
- Tricyclic anti-depressants
- Beta-blockers
- Carbon monoxide
- Opiates
- Digoxin
- Benzodiazepines

Clinical Science:

- Drug actions at receptor and intracellular level
- Principles of absorption, distribution, metabolism and excretion of drugs
- Effects of genetics on drug metabolism
- Pharmacological principles of drug interaction
- Outline the effects on drug metabolism of: pregnancy, age, renal and liver impairment

i. Allergy

Common or Important Allergy Problems

- Anaphylaxis
- Recognition of common allergies; introducing occupation associated allergies
- Food, drug, latex, insect venom allergies
- Urticaria and angioedema

Clinical Science

- Mechanisms of allergic sensitization: primary and secondary prophylaxis
- Natural history of allergic diseases
- Mechanisms of action of anti-allergic drugs and immunotherapy
- Principles and limitations of allergen avoidance

j. Medicine in the Elderly

Common or Important Problems:

- Deterioration in mobility
- Acute confusion
- Stroke and transient ischemic attack
- Falls
- Age related pharmacology
- Hypothermia
- Continence problems
- Dementia
- Movement disorders including Parkinson's disease
- Depression in the elderly
- Osteoporosis
- Malnutrition
- Osteoarthritis

Clinical Science:

- Effects of ageing on the major organ systems
- Normal laboratory values in older people

k. Musculoskeletal System

Common or Important Problems:

- Septic arthritis
- Rheumatoid arthritis
- Osteoarthritis
- Seronegative arthritides

- Crystal arthropathy
- Osteoporosis – risk factors, and primary and secondary prevention of complications of osteoporosis
- Polymyalgia and temporal arteritis
- Acute connective tissue disease: systemic lupus erythematous, scleroderma, poly- and Dermatomyositis, Sjogren's syndrome, vasculitides

Clinical Science:

- Pharmacology of major drug classes: NSAIDS, corticosteroids, immunosuppressants, colchicines, allopurinol, bisphosphonates

l. Neurology

Common or Important Problems:

- Acute new headache
- Stroke and transient ischaemic attack
- Subarachnoid haemorrhage
- Coma
- Central Nervous System infection: encephalitis, meningitis, brain abscess
- Raised intra-cranial pressure
- Sudden loss of consciousness including seizure disorders (see also above syncope etc.)
- Acute paralysis: Guillian-Barré, myasthenia gravis, spinal cord lesion
- Multiple sclerosis
- Motor neuron disease

Clinical Science:

- Pathophysiology of pain, speech and language
- Pharmacology of major drug classes: anxiolytics, hypnotics inc. benzodiazepines, antiepileptics, anti-Parkinson's drugs (anti-muscarinics, dopaminergics)

m. Psychiatry

Common and /or Important Problems:

- Suicide and parasuicide
- Acute psychosis
- Substance dependence
- Depression

Clinical Science:

- Principles of substance addiction, and tolerance
- Pharmacology of major drug classes: anti-psychotics, lithium, tricyclic antidepressants, mono-amine oxidase inhibitors, SSRIs, venlafaxine, donepezil, drugs used in treatment of addiction (bupropion, disulpharam, acamprosate, methadone)

n. Cancer and Palliative Care

Common or Important Oncology Problems:

- Hypercalcaemia
- SVC obstruction
- Spinal cord compression
- Neutropenic sepsis
- Common cancers (presentation, diagnosis, staging, treatment principles): lung, bowel, breast, prostate, stomach, oesophagus, bladder)
- *Common or Important Palliative Care Problems:*
- Pain: appropriate use, analgesic ladder, side effects, role of radiotherapy
- Constipation
- Breathlessness
- Nausea and vomiting
- Anxiety and depressed mood

Clinical Science:

- Principles of on cogenesis and metastatic spread
- Apoptosis
- Principles of staging

- Principles of screening
- Pharmacology of major drug classes in palliative care: anti-emetics, opioids, NSAIDS, agents for neuropathic pain, bisphosphonates, laxatives, anxiolytics

o. Dermatology;

Common and / or Important Problems:

- Cellulitis
- Cutaneous drug reactions
- Psoriasis and eczema
- Skin failure: e.g. erthryoderma, toxic epidermal necrolysis
- Urticaria and angio-oedema
- Cutaneous vasculitis
- Herpes zoster and Herpes Simplex infections
- Skin tumours
- Skin infestations
- Dermatomyositis
- Scleroderma
- Lymphoedema

Clinical Science:

- Pharmacology of major drug classes: topical steroids, immunosuppressants

p. Clinical Genetics

Common and / or Important problems:

- Down's syndrome
- Turner's syndrome
- Huntington's disease
- Haemochromatosis
- Marfan's syndrome
- Klinefelter's syndrome
- Familial cancer syndromes
- Familial cardiovascular disorders

Clinical Science:

- Structure and function of human cells, chromosomes, DNA, RNA and cellular proteins
- Principles of inheritance: Mendelian, sex-linked, mitochondrial
- Principles of pharmacogenetics
- Principles of mutation, polymorphism, trinucleotide repeat disorders
- Principles of genetic testing including metabolite assays, clinical examination and analysis of nucleic acid (e.g. PCR)

q. Community Medicine and Public Heath

Important topics:

- Concept of Health & Disease
- Introduction to Public Health and Health Systems in Pakistan
- Health System in Pakistan
- Epidemiology and disease control
- Prevention and control of Infectious diseases
- Dynamics of Infectious disease Transmission
- Epidemiology, control and prevention of Infectious diseases of Public Health Importance
- Epidemiology, control and prevention of non-Infectious diseases of Public Health Importance
- Biostatistics
- Health Management Information System
- Demography and population dynamics
- Food and Nutrition
- Reproductive and child health
- Heath of school age children
- Environmental Health Sciences
- Occupational Health
- Arthropods and their public health importance

- Prevention and control of parasitic diseases of public health importance
- Behavioral Sciences and lifestyle
- Information, Education and Communication (IEC)
- Disaster

RESEARCH/THESIS WRITING

Total of 6 months (year 05) will be allocated for work on a research project with thesis writing. Project must be completed and thesis be submitted before the end of training. Research can be done as one block in 5th year of training or it can be stretched over five years of training in the form of regular periodic rotations during the course as long as total research time is equivalent to one calendar year.

Research Experience

The active research component program must ensure meaningful, supervised research experience will appropriate protected time for each resident while maintaining the essential clinical experience. Recent productivity by the program faculty and by the residents will be required, including publications in peer-reviewed journals residents must learn the design and interpretation of research studies, responsible use of informed consent and research methodology and interpretation of data. The program must provide instruction in the critical assessment of new therapies and of the surgical literature. Resident should be advised and supervised by qualified staff members in the conduct of research.

Clinical Research

Each resident will participate in at least one clinical research study to become familiar with:

1. Research design
2. Research involving human subjects including informed consent and operations of the institutional Review Board and ethics of human experimentation.
3. Data collection and data analysis
4. Research ethics and honesty
5. Peer review process

This usually is done during the consultation and outpatient clinical rotations.

Case Studies or Literature Reviews

Each resident will write, and submit for publication in a peer-reviewed journal, a case study or literature review on a topic of his /her choice.

Laboratory Research

Bench Research

Participation in laboratory research is at the option of the resident and may be arranged through any faculty member of the Division. When appropriate, the research may be done at other institutions.

Research involving animals

Each resident participating in research involving animals is required to:

1. Become familiar with the patient Rules and Regulations of the Rawalpindi Medical University i.e. those relating to “Health and Medical Surveillance Program for Laboratory Animal Care Personnel” and “Care and Use of Vertebrate Animal as Subjects in Research and Teaching”
2. Read the “Guide for the Care and Use of Laboratory Animals”
3. View the videotape of the symposium on Human Animal Care

Research involving Radioactivity

Each resident participating in research involving radioactive materials in required to

1. Attend a Radiation Review session
2. Work with a Authorized User and receive appropriate instruction from him/her.

Accreditation related issues of the institution

A) Faculty

Properly qualified teaching staff in accordance with the requirements of Pakistan Medical and Dental Council (PMDC)

B) Resources

Adequate Space including class-rooms (with audiovisual aids), demonstration rooms, visualaids educational aids work/study spaces, computer lab and clinical pathology lab etc.

C) Library

Departmental library should have latest editions of recommended books, reference books and latest journals (National and International).

- Accreditation of Infectious diseases training program can be suspended on temporary or permanent basis by the University, if the program does not comply with requirements for residents training as laid out in this curriculum.
- Program should be presented to the University along with a plan for implementation of curriculum for training of residents.
- Programs should have documentation of residents training activities and evaluation on monthly basis.
- To ensure a uniform and standardized quality of training and availability of the training facilities, the University reserves the right to make surprise visits of the training program for monitoring purposes and may take appropriate action if deemed necessary.

D) Sponsoring Institute

Rawalpindi Medical University, Rawalpindi

E) Participating Site

Holy Family Hospital, Rawalpindi.

TIME LINE/REGULATIONS OF TRAINING PROGRAM
DURATION OF TRAINING: 5 YEARS

Part-I	
In first 6 months the resident will learn the basic sciences (physiology, biochemistry, pathology, research methodology and biostatistics) relevant to Speciality, fundamental concepts in medicine and principles of infectious diseases. In the remaining 24 months resident will complete his/her tenure in Internal medicine department, during this training period the residents will also acquire clinical knowledge and skill related to infectious diseases in these specialities: Cardiology, Nephrology, Gastroenterology and Transplant Unit. Note: Fellow who have completed FCPS/MD internal medicine will be exempted from part I.	**30 moths (2.5 years)**
Part-II	
In this part of training Residents will acquire professional skill and knowledge related to Infectious Diseases as per core curriculums. During this training period the residents will also complete 04 clinical rotations each of 02 months in Critical care unit, Clinical Microbiology, Community Medicine and Public Healthcare and Research Unit Note: The tenure of part II for fellows who have completed FCPS/MD internal medicine will be 18 months.	**24 moths (2 years)**
Part-III	
Research and Thesis working	**6 months**

EVALUATION & ASSESSMENT STRATEGIES

Assessment

It will consist of action and professional growth oriented resident-centered integrated assessment with an additional component of informal internal assessment, formative assessment and measurement-based summative assessment.

Resident-Centered Integrated Assessment

It views students as decision-makers in need of information about their own performance. Integrated Assessment is meant to give students responsibility for deciding what to evaluate, as well as how to evaluate it, encourages students to **'own'** the evaluation and to use it as a basis for self-improvement. Therefore, it tends to be growth-oriented, resident-controlled, collaborative, dynamic, contextualized, informal, flexible and action-oriented.

In the proposed curriculum, it will be based on:

- Self-Assessment by the resident
- Peer Assessment
- Informal Internal Assessment by the Faculty

Self-Assessment by the Resident

Each resident will be provided with a pre-designed self-assessment form to evaluate his/her level of comfort and competency in dealing with different relevant clinical situations. It will be the responsibility of the resident to correctly identify his/her areas of weakness and to take appropriate measures to address those weaknesses.

Peer Assessment

The residents will also be expected to evaluate their peers after the monthly small group meeting. These should be followed by a constructive feedback according to the prescribed guidelines and should be non-judgmental in nature. This will enable students to become good mentors in future.

Informal Internal Assessment by the Faculty

There will be no formal allocation of marks for the component of internal assessment so that students are willing to confront their weaknesses rather than hiding them from their instructors.

It will include:

a. Punctuality

b. Ward work

c. Monthly assessment (written tests to indicate particular areas of weaknesses)

d. Participation in interactive sessions

Formative Assessment

Will help to improve the existing instructional methods and the curriculum in use

Feedback to the faculty by the students:

After every three months students will be providing a written feedback regarding their course components and teaching methods. This will help to identify strengths and weaknesses of the relevant course, faculty members and to ascertain areas for further improvement.

Summative Assessment

It will be carried out at the end of the program to empirically evaluate cognitive, psychomotor and affective domains in order to award degrees for successful completion of courses.

Final evaluation

- The program director must provide a final evaluation for each fellow upon completion of the program
- A clinical competency committee including external and internal members must be appointed by the program director to assess the resident at the end of the program.

Faculty evaluation

A process to evaluate each faculty member performance related to educational program annually

a) Teaching abilities

b) Engagement with educational program

c) Participate in faculty development related to their skills and educators, clinical performance, professionalism and scholarly activities.

Mandatory workshops

- Research methodology and biostatistics
  - Synopsis writing
  - Communication skills
  - Introduction to computer/information technology and software programs
- The workshop will be held on 03 monthly basis
- An appropriate fee for each workshop will be charged
- Each workshop will be of 02-05 days duration
- Certificates of attendance will be issued upon satisfactory completion of workshops

LOG BOOK

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be part of the requirement to sit for MD examination. Log book should include adequate number of diagnostic and therapeutic procedures observed and performed, the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

Proposed Format of Log Book is as follows:

Candidate's Name: ----------

Supervisor ----------

Roll No. ----------

The procedures shall be entered in the log book as per format.

Residents should become proficient in performing the related procedures (pg. 43). After observing the technique, they will be observed while performing the procedure and, when deemed competent by the supervising physician, will perform it independently. They will be responsible for obtaining informed consent, performing the procedure, reviewing the results with the pathologist and the attending physician and informing the patient and, where appropriate, the referring physician of the results.

Procedures Performed

Sr.#	Date	**Name of Patient, Age, Sex & Admission No.**	**Diagnosis**	**Procedure Performed**	**Supervisor's Signature**
1.					
2.					
3.					
4.					

Emergencies Handled

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Diagnosis	Procedure Performed	Supervisor's Signature
1.					
2.					
3.					
4.					

Case Presented

Sr.#	Date	Name of Patient, Age, Sex & Admission No.	Case Presented	Supervisor's Signature
1.				
2.				
3.				
4.				

Seminar/Journal Club Presentation

Sr.#	Date	Topic	Supervisor's Signature
1.			
2.			
3.			
4.			

Evaluation Record

(Excellent, Good, Adequate, Inadequate, Poor)
At the end of the rotation, each faculty member will provide an evaluation of the clinical performance of the resident.

Sr.#	Date	Method of Evaluation (Oral, Practical, Theory)	Rating	Supervisor's Signature
1.				
2.				

EXAMINATION SCHEDULE

Intermediate Examinations

All candidates enrolled in M.D. Infectious diseases program shall appear in Intermediate examination at the end of 2.5 calendar years. Fellow who have completed FCPS/MD internal medicine will be exempted from intermediate examination.

Eligibility Criteria:

The candidates appearing in Intermediate Examination are required:

a. To have submitted certificate of completion of mandatory workshops.
b. To have submitted certificate of completion of first two years of training from the supervisor/ supervisors of rotations.
c. To have submitted CIS assessment proforma from his/her own supervisor on 03 monthly basis and also from his/her supervisors during rotation, achieving a cumulative score of 75%.
d. To have submitted certificate of approval of synopsis or undertaking / affidavit that if synopsis not approved with 30
e. days of submission of application for the Intermediate Examination, the candidate will not be allowed to take the examinations and shall be removed from the training program.
f. To have submitted evidence of payment of examination fee.

Intermediate Examination Schedule and Fee

a. Intermediate Examination at completion of 30 months (2.5 years) training, will be held twice a year.
b. There will be a minimum period of 30 days between submission of application for the examination and the conduction of examination.
c. Examination fee will be determined periodically by the University.
d. The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.

e. The Controller of Examinations will issue Roll Number Slips on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee.

Written Part of Intermediate Examination

The candidate of MD Infectious diseases program will appear in the subject of principles of Internal Medicine and relevant basic sciences.

Written Examination = 300 Marks

Clinical, TOACS/OSCE & ORAL = 200 Marks

Written Examination:

The marks of written exam will be divided as follows:

MCQs = 200 Marks

SEQs = 100 Marks

Total = 300 Marks

Principles of Internal Medicine = 70 MCQs 7 SEQs

Specialty specific = 10 MCQs 1 SEQs

Basic Sciences (Physiology, Pharmacology, Pathology) = 20 MCQs 2 SEQs

Total = 100 MCQs 10 SEQs

Clinical, TOACS/OSCE & ORAL

Four Short Cases = 100 Marks

One Long Case = 50 Marks

Toacs/OSCE & Oral = 50 Marks

Total = 200 Marks

DECLARATION OF INTERMEDIATE EXAMINATION RESULTS

The Candidate will have to score 50% marks in written, Clinical, TOACS/OSCE & ORAL component and a cumulative score of 60% to be declared successful in the Intermediate Examination.

A maximum total of four consecutive attempts (availed or unavailed) will be allowed in the Intermediate Examination during which the candidate will be allowed to continue his training program. If the candidate fails to pass his Intermediate Examination within the above mentioned limit of four attempts, the candidate shall be removed from the training program, and the seat would fall vacant, stipend/ scholarship if any would be stopped.

SUBMISSION / EVALUATION OF SYNOPSIS

1. The candidates shall prepare their synopsis as per guidelines provided by the Advanced Studies & Research Board, available on university website.
2. The research topic in clinical subject should have 30% component related to basic sciences and 70% component related to applied clinical sciences. The research topic must consist of a reasonable sample size and sufficient numbers of variables to give training to the candidate to conduct research, to collect & analyze the data.
3. Synopsis of research project shall be submitted by the end of the 2nd year of MD program. The synopsis after review by an Institutional Review Committee shall be submitted to the University for Consideration by the Advanced Studies & Research Board, through the Principal / Dean /Head of the institution.

Submission of Thesis

1. Thesis shall be submitted by the candidate duly recommended by the Supervisor.
2. The minimum duration between approval of synopsis and submission of thesis shall be one year.
3. The research thesis must be compiled and bound in accordance with the Thesis Format Guidelines approved by the University and available on website.
4. The research thesis will be submitted along with the fee prescribed by the University.

Thesis Examination

a. The candidate will submit his/her thesis at least 06 months prior to completion of training.
b. The Thesis along with a certificate of approval from the supervisory will be submitted to the Registrar's office, who would record the date / time etc. and get received from the Controller of Examinations within 05 working days of receiving.
c. The Controller of Examinations will submit a panel of eight examiners within 07 days for selection of four examiners by the Vice Chancellor. The Vice Chancellor shall return the final panel within 05 working days to the Controller of Examinations for

processing and assessment. In case of any delay the Controller of Examinations would bring the case personally to the Vice Chancellor.

d. The Supervisor shall not act as an examiner of the candidate and will not take part in evaluation of thesis.
e. The Controller of Examinations will make sure that the Thesis is submitted to examiners in appropriate fashion and a reminder is sent after every ten days.
f. The thesis will be evaluated by the examiners within a period of 06 weeks.
g. In case the examiners fail to complete the task within 06 weeks with 02 fortnightly reminders by the Controller of Examinations, the Controller of Examinations will bring it to the notice of Vice Chancellor in person.
h. In case of difficulty in find an internal examiner for thesis evaluation, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person as examiner in supersession of the relevant Clause of the University Regulations.
i. There will be two internal and two external examiners. In case of difficulty in finding examiners, the Vice Chancellor would, in consultation with the concerned Deans, appoint minimum of three, one internal and two external examiners.
j. The total marks of thesis evaluation will be 400 and 60% marks will be required to pass the evaluation.
k. The thesis will be considered accepted, if the cumulative score of all the examiners is 60%.
l. The clinical training will end at completion of stipulated training period but the candidate will become eligible to appear in the Final Examination at completion of clinical training and after acceptance of thesis. In case clinical training ends earlier, the slot will fall vacant after stipulated training period.

FINAL EXAMINATION IN MD INFECTIOUS DISEASES

At the end of 5th year of M.D. **Infectious Diseases** Program.

Eligibility Criteria:

To appear in the Final Examination the candidate shall be required:

1. To have submitted the result of passing Intermediate Examination.
2. To have submitted the certificate of completion of training, issued by the Supervisor/Dean will be mandatory.
3. To have achieved a cumulative score of 75% in Continuous Internal assessments of all training years.
4. To have got the thesis accepted and will then be eligible to appear in Final Examination.
5. To have submitted no dues certificate from all relevant departments including library, hostel, cashier etc.
6. To have submitted evidence of submission of examination fee.

Final Examination Schedule and Fee

a) Final examination will be held twice a year.

b) The candidates have to satisfy eligibility criteria before permission is granted to take the examination.

c) Examination fee will be determined and varied at periodic intervals by the University.

d) The examination fee once deposited cannot be refunded / carried over to the next examination under any circumstances.

e) The Controller of Examinations will issue an Admittance Card with a photograph of the candidate on receipt of prescribed application form, documents satisfying eligibility criteria and evidence of payment of examination fee. This card will also show the Roll Number, date / time and venue of examination.

Components of Final Examination

Written Part of Final Examination	Total marks 500
Clinical, TOACS/OSCE & ORAL	Total marks 500
Contribution of CIS to the Final Examination	Total marks 100
Thesis Evaluation	Total marks 400

Written Part of Final Examination

a. There will be two written papers which will cover the whole syllabus of the specialty of training with total marks of 500.
b. The written examination will consist of 200 single best answer type Multiple Choice Questions (MCQs) and 10 Short Essay Questions (SEQs). Each correct answer in the Multiple Choice Question paper will carry 02 marks, but an incorrect response will result in deduction of 0.5 mark. Each Short Essay Question will carry 10 marks.
c. The Total Marks of the Written Examination will be 500 and to be divided as follows:
    - Multiple Choice Question paper Total Marks = 400
    - Short Essay Question paper Total Marks = 100
d. The candidates scoring a score of 50% marks in multiple choice question paper and short essay question paper will pass the written part of the final examination and will become eligible to appear in the clinical and Toacs/OSCE & Oral.
e. The written part result will be valid for three consecutive attempts for appearing in the Clinical and Oral Part of the Final Examination. After that the candidates have to re-sit the written part of the Final Examination.

Clinical, TOACS/OSCE & ORAL:

a) The Clinical and Oral Examination will consist of 04 short cases, 01 long case and Toacs/OSCE & Oral with 01 station for a pair of Internal and External Examiner Each short case will be of 07 minutes duration, 05 minutes will be for examining the patient and 02 minutes for discussion. The Oral Examination will

consist of laboratory data assessment, interpretation of Radiology images, ECG and others.

1. The Total Marks of Clinical, TOACS/OSCE & ORAL will be 500 and to be divided as follows:
2. Short Cases Total Marks = 200
3. Long Case Total Marks = 100
4. TOACS/OSCE & ORAL Total Marks = 200

b) A panel of four examiners will be appointed by the Vice Chancellor and of these two will be from RMU whilst the other two will be the external examiners. Internal examiner will act as a coordinator. In case of difficulty in finding an internal examiner in a given subject, the Vice Chancellor would, in consultation with the concerned Deans, appoint any relevant person with appropriate qualification and experience, outside the University as an examiner.

c) The internal examiners will not examine the candidates for whom they have acted as Supervisor and will be substituted by other internal examiner.

d) The candidates scoring 50% marks in each component of the Clinical & Oral Examination will pass this part of the Final Examination.

e) The candidates will have two attempts to pass the final examination with normal fee. A special administration fee of Rs.10,000 in addition to normal fee or the amount determined by the University from time to time shall be charged for further attempts.

DECLARATION OF RESULT

For the declaration of result:-

1. The candidate must get his/her Thesis accepted.
2. The candidate must have passed the final written examination with 50 % marks and the clinical & oral examination securing 50% marks. The cumulative passing score from the written and clinical and Toacs/OSCE & Oral shall be 60%.
3. The MD degree shall be awarded after acceptance of thesis and success in the final examination.
4. On completion of stipulated training period, irrespective of the result (pass or fail) the training slot of the candidate shall be declared vacant.

AWARD OF MD INFECTIOUS DISEASES DEGREE

After successful completion of the structured courses of MD Infectious diseases and qualifying Intermediate & final examinations, (written, clinical, Toacs/OSCE & Oral and thesis) the degree with title MD Infectious diseases shall be awarded to the candidate.

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