RAWALPINDI MEDICAL UNIVERSITY

REGULATIONS & CURRICULUM

MD PROGRAM ANATOMY

(2024)


بسم الله الرحمن الرحيم

REGULATIONS & CURRICULUM

MD ANATOMY (2024)

Preamble

Welcome to the MD program in Anatomy at Rawalpindi Medical University. As a pioneering institution dedicated to medical excellence, we are proud to offer a program that combines rigorous academic coursework with extensive practical experience to prepare the next generation of anatomical experts. This program is designed to provide comprehensive training in the anatomical sciences, emphasizing both traditional approaches and innovative techniques in medical education.

The MD program in Anatomy is a testament to the commitment of researchers and scholars to explore the frontiers of anatomical science. This program provides a unique opportunity for individuals to delve deeper into the intricacies of human and comparative anatomy, contributing to our understanding of the form and function of biological structures. It encourages critical thinking, research excellence, and the advancement of anatomical knowledge. The research undertaken within the MD in Anatomy program is both challenging and rewarding. Scholars engage in a wide range of projects, from macroscopic studies of anatomical structures to microscopic examinations of tissues and cellular processes. This research not only expands our comprehension of anatomy but also has far-reaching implications in the fields of medicine, surgery, forensic science, and education.

As we embark on this academic journey, it is imperative to recognize the significance of interdisciplinary collaboration. Anatomy intersects with various fields, such as physiology, pathology, biomechanics, and genetics, creating a fertile ground for innovative research and applications. This program encourages scholars to work synergistically with experts from diverse backgrounds, fostering a holistic approach to anatomical investigations. Furthermore, ethical considerations and the responsible conduct of research are fundamental principles that guide our endeavors. Scholars are expected to uphold the highest standards of ethical conduct in their studies, respecting the rights and dignity of donors, subjects, and participants involved in anatomical research.

In conclusion, the MD in Anatomy program represents an opportunity to contribute to the collective body of knowledge in this dynamic field. It is a platform for aspiring anatomists and researchers to explore the hidden secrets of life's architecture, bridging the gap between past discoveries and future breakthroughs. Our MD Anatomy program is not just a degree; it is an opportunity to make a substantial impact on the future of healthcare. As we embark on this journey, we aspire to not only advance our own understanding but also to enrich the global anatomical community with our discoveries and insights. We invite you to explore the possibilities that our MD Anatomy program offers and to join us in our commitment to shaping a healthier future.

Curriculum Development Team

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SECTION-I

INTRODUCTION TO UNIVERSITY

History of Rawalpindi Medical University

Rawalpindi Medical College was established in Faisalabad on 18th March 1974 and later shifted to Rawalpindi on 5th November 1974 in an incomplete building at Tipu Road. The founder principal of RMC, Prof. Abdul Latif, worked hard to establish the institution. The student hostels, staff colony and auditorium were built. Apart from his own specialty of anatomy he completed all the faculty. He also managed to acquire the Holy family hospital from missionary church and central Government Hospital from central Government that later became Rawalpindi General Hospital and now Benazir Bhutto Hospital. The District headquarter Hospital was also affiliated to the college as 1st teaching hospital.

Prof. Mohammad Nawaz the 2nd Principal and Prof. Mohammad Iqbal as Professor of surgery and later on Principal played pivotal as pioneer team to establish all components of RMC. Prof. Iqbal, Prof. Saad Rana worked hard to establish New Teaching Block in Holy Family Hospital with help of Islamic Development Bank.

The Legacy was taken forward by respective forthcoming Principals, worth mentioning is Prof. Mubashir Hussain Malik who established department of of Psychiatry and worked hard to develop its international collaborations. The Department of Medical Education and the institute of Allied health sciences established in 2007 was the vision of Prof. Muhammad Musadiq Khan, he also started the new teaching block holy family hospital Rawalpindi as well as ICU and CCU.

First Rawalian Principal, Prof. Mohammad Umar after taking over the office in 2013, started working on multi-dimensional approach to further develop the institution. He restructured the undergraduate training program by establishing purpose built Department of Medical Education (DME), upgraded student libraries, Cafeteria, student section and hostels. Arranging historical meeting to develop consensus on national guidelines for the undergraduate training headed by chairman HEC, President PMDC, Vice chancellor UHS and all the principals of medical colleges is another credit to RMC in his tenure.

Regarding patient care projects, worth mentioning are state of the art center for Liver and Digestive diseases(CLD), Multi Organ Failure Centre(MOF), Medical ICU, Department of Infectious diseases (DID), Department of Emergency and Critical care(DEC) and up gradation of the affiliated hospitals.

To establish recognized postgraduate training in super specialties international conferences, Mentorship program are other important achievements.

Since 1947 more than 7900 students have graduated and are serving nationally and internationally. RMC is privileged to claim top positions in university examination several times. Best of the best graduate in UHS is also a Rawalian.

Academic programs of the college are accredited by UHS, CPSP and PMDC. The College got full recognition by General Medical Council UK, American specialty boards and internship programs with different universities abroad and WHO.

Rawalpindi Medical College has always occupied a unique position in the public sector, being one of the leading medical colleges in South Asia. It serves as an extraordinary interface between health care provision and medical education; with the three allied hospitals bearing the brunt of the city's health care needs, medical and paramedical undergraduate courses that train the sharpest minds of the country, and diverse post-graduate training programs.

Now Main Campus mainly serves administrative purposes and the first two i.e. non-clinical years of the students of MBBS degree are taught there and next three in New Teaching Block Holy Family hospital.

The institute has strived to be upgraded to the level of an independent University after which the annual system of MBBS degree has been changed to the internationally preferred modular system. Now after the successful launching of Modular system by Worthy VC RMU we are struggling hard to get the MD and PhD program approve.

VISION & MISSION OF RAWALPINDI MEDICAL UNIVERSITY

Mission Statement:

- **To impart evidence based research oriented medical education**
- **To provide best possible patient care**
- **To inculcate the values of mutual respect and ethical practice of medicine**

Vision:

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals.

SECTION-II

INTRODUCTION TO MD ANATOMY PROGRAM

Anatomy, the study of the structure and organization of living organisms, serves as the foundation upon which the understanding of the human body and its intricate mechanisms is built. It is a discipline that has witnessed profound developments over centuries, evolving from rudimentary dissections to cutting-edge imaging techniques and molecular studies. The pursuit of knowledge in this field is a ceaseless journey, as new discoveries continue to unravel the complexities of the human body and its counterparts in the animal kingdom.

Anatomy forms the basis for the practice of medicine. It leads the physician towards an understanding of a patient's disease whether by physical examination or using imaging techniques. It is also important in allied health programs in aspects of patient management that begin with an analysis of clinical signs.

Knowledge and skills in the field of macroscopic and microscopic Anatomy will enable medical graduates to practice medicine successfully and scientists to pursue a career in the discipline of Anatomy. Knowledge of the structure of the human body from what can be seen with the unaided eye (gross anatomy) down to the molecular level is fundamental to understanding bodily function and how both structure and function are modified by disease.

During the last few decades, there has been an explosion of new techniques for imaging anatomy in living patients. Examples range from endoscopy and laparoscopy to computed tomography (CT) and magnetic resonance imaging (MRI), together with newly emerging technology for three-dimensional visualization. The emergence of these sophisticated imaging techniques has been accompanied by the development of minimally invasive therapy targeted to specific organs and/or sites within them

As a result, knowledge of anatomy has become increasingly important, not only to interpret the images that are produced by these sophisticated techniques, but also to understand the pathway for targeting therapy to a specific site

Ironically, at a time when knowledge of anatomy is increasingly important, we now are facing a crisis in anatomical education. A deepening shortage of experienced faculty members willing to teach gross anatomy to medical and dental students, as well as other health professions students, has developed. Keeping in view the persistent demand from students and urgent need for experts in the field of Anatomy, it is highly imperative to initiate our own MD program in this field.

Goals and General Objectives of Postgraduate Medical Education Program Goals

The primary goal of the postgraduate medical education at Rawalpindi Medical University is to cultivate highly competent specialists and medical teachers who will excel in their fields and significantly contribute to the medical community. This goal aligns with the standards set by the Post Graduate Medical Education Regulations 2000 and its amendments up to May 2018. Our program aims to develop graduates who are:

Community-Oriented Professionals: Graduates will be attuned to the health needs of the community, ensuring that their professional activities uphold the ethical standards expected of medical practitioners and align with the objectives of the national health policy.

Skilled Practitioners at All Levels of Healthcare: Our specialists are trained to master a comprehensive range of competencies necessary for effective practice at both secondary and tertiary levels of healthcare delivery. This ensures a high standard of care and service across different settings.
Informed by Advances in Medical Science: Postgraduates will be continuously updated with the latest developments and contemporary advances in their respective disciplines, ensuring that their practice remains at the cutting edge of medical science.
Research-Oriented and Analytical Thinkers: The program instills a robust understanding of research methodology and epidemiology. Graduates develop a scientific inquiry mindset, empowering them to contribute to medical research and evidence-based practice.
Educators of Future Medical Professionals: Equipped with fundamental teaching skills, our graduates are prepared to effectively impart knowledge and skills to medical and paramedical professionals. This commitment to education enriches the learning environment and fosters the development of the next generation of healthcare providers.
Through these objectives, Rawalpindi Medical University's postgraduate medical education program aspires to produce not only skilled medical specialists but also visionary leaders in medical education and research.

General Objectives

The general objectives of postgraduate training at Rawalpindi Medical University are designed to cultivate a comprehensive skill set in medical graduates, enabling them to excel both as practitioners and educators in the healthcare field. Here are the key objectives:
Clinical Proficiency: Trainees will achieve a high level of clinical competence, capable of diagnosing and managing a wide range of conditions with confidence and ethical consideration. The program emphasizes practical experience, decision-making skills, and the use of evidence-based practices.
Medical Knowledge: Participants will gain a deep understanding of the various diseases and health conditions pertinent to their specialty. This includes staying informed about the latest research, treatments, and advancements in medical technology and pharmacology.
Research Skills: A significant focus is placed on developing the ability to conduct meaningful medical research. This includes formulating research questions, designing studies, analyzing data, interpreting results, and publishing findings. The aim is to nurture a lifelong commitment to advancing medical science.
Professionalism and Ethics: The training program enforces the highest standards of professionalism and ethical behavior. This objective ensures that all medical practices are conducted with respect for patients' dignity and rights, adherence to the ethical guidelines of the medical profession, and compliance with regulatory frameworks.
Communication Skills: Effective communication skills are critical for successful interactions with patients, families, and other healthcare professionals. Trainees will learn to communicate complex medical information clearly and compassionately, ensuring that patients are well-informed about their conditions and treatment options.
Leadership and Management Skills: The program prepares graduates to take on leadership roles within the healthcare sector. This includes managing teams, optimizing healthcare delivery, navigating complex healthcare systems, and advocating for health policy improvements.
Teaching Competency: Since many graduates will go on to teach the next generation of medical professionals, a key objective is to equip them with the skills necessary for effective teaching. This covers curriculum development, student assessment, and the use of innovative teaching methods.
Adaptability to Changes in Healthcare: Trainees are prepared to adapt to the rapidly changing

healthcare landscape, including new healthcare technologies, changing patient demographics, and evolving healthcare policies.

Community Health Awareness: Graduates are expected to extend their expertise beyond the hospital setting into community health. They are trained to understand and address community-specific health issues, contribute to public health strategies, and promote preventive healthcare measures.

Through these objectives, Rawalpindi Medical University ensures its postgraduate trainees are well-equipped to meet the challenges of modern medical practice and contribute positively to the overall health of the community.

Specific Learning Objectives

At the conclusion of the postgraduate program, students should be proficient in the following areas across three domains:

Cognitive Domain

- Accurately describe the gross anatomy of the entire human body.
- Effectively integrate anatomical structures with their functions.
- Understand and describe the structural relationships among various body parts.
- Utilize knowledge of positional relationships in clinical practice.
- Explain the fundamentals of microscopy, including staining techniques and the use of a microtome.
- Detail the microanatomy of all human body tissues and relate these structures to their functions.
- Outline the general and system-specific developmental processes of the human body, and relate developmental anomalies to stages of normal development.
- Describe the normal sectional and radiological anatomy of various body regions.
- Understand and explain basic genetic principles and apply these in clinical contexts.
- Discuss the impact of teratogenic agents on development.
- Elucidate the immunology of the human body, including related disorders.
- Describe the anatomy and function of the brain and spinal cord, relating this to clinical scenarios.
- Discuss anthropological traits and the comparative evolution of the human body.

Psychomotor Domain

- Perform detailed dissections of the human body, divided by region.
- Identify and demonstrate the relationships between anatomical structures.
- Prepare embalming fluids for storage in tanks and museum jars, and perform embalming on human cadavers.
- Create and preserve museum-quality anatomical specimens.
- Conduct window dissections to highlight specific structures.
- Prepare and stain histology slides using Hematoxylin and Eosin (H&E).
- Identify all human body tissues using various microscopic techniques.
- Section and prepare slides of the brain and spinal cord.
- Prepare and analyze embryological slides, including those of chick embryos.

- Utilize anthropological instruments effectively.
- Recognize different anatomical structures through various imaging techniques.
- Employ effective teaching and learning methods in medical education.
- Display research findings and demonstrate proficiency in scientific writing and presentation skills.
- Demonstrate both living and surface anatomy using a live model or cadaver.

Affective Domain

- Show respect and care in the handling of human bodies and cadavers.
- Apply a humane approach during live anatomy demonstrations.
- Maintain professional integrity by keeping personal beliefs and prejudices separate from professional responsibilities.
- Express empathy and understanding in educational settings.
- Demonstrate strong work ethics and the ability to work effectively within a team.
- Communicate with a professional demeanor and attitude in all interactions.
- These objectives aim to mold graduates who are not only skilled in their technical and scientific expertise but also demonstrate ethical, professional, and compassionate care in their practices.

Statement of Competencies

In alignment with the overarching goals of our postgraduate training program, each discipline is committed to developing a set of specific competencies, meticulously defined and clearly articulated. At the outset of the program, each department will present a detailed statement of these competencies to the trainees, ensuring they are fully aware and can thus tailor their efforts towards achieving these goals. The competencies focus on critical aspects of medical practice and research, ensuring a holistic development of each trainee.

Components of the Postgraduate Curriculum

To achieve the stated competencies, our curriculum is structured around several key components that encompass both theoretical and practical dimensions of medical education:

Theoretical Knowledge: Trainees will engage in advanced study to deepen their understanding of their chosen medical specialty. This component includes lectures, seminars, and self-directed learning to ensure comprehensive knowledge of current and evolving medical sciences.

Practical/Clinical Skills: Hands-on training in a clinical setting is a cornerstone of the curriculum, enabling trainees to apply theoretical knowledge in real-world scenarios. This includes rotations through various departments, supervised direct patient care, and simulations.

Training in Writing Thesis/Research Articles: As part of developing research acumen, trainees will be guided through the process of academic writing, including formulation of research questions, data collection and analysis, and manuscript preparation for publication.

Attitudes, Including Communication: Emphasis is placed on cultivating professional attitudes and interpersonal skills, ensuring trainees can communicate effectively with patients, families, and healthcare teams. This component is vital for developing empathy, ethical practices, and patient advocacy.

Training in Research Methodology, Medical Ethics & Medicolegal Aspects: This critical aspect of the curriculum involves training in the ethical conduct of research, understanding and applying medical ethics in practice, and recognizing the medicolegal responsibilities of healthcare providers.

Teaching Skills for Undergraduates, Juniors, and Support Teams: Trainees will also acquire skills in educating others, including undergraduate students, junior trainees, and allied health staff. This training prepares them for roles as educators and mentors in their professional careers.

Each of these components is integral to the formation of a competent, ethical, and knowledgeable medical specialist capable of contributing to both healthcare and academic settings. By outlining these components and related competencies, Rawalpindi Medical
University ensures that all trainees are well-prepared to meet the demands of their professions and advance in their careers with confidence and integrity.

SECTION-III

PROGRAM RESOURCES

Introduction to Anatomy Department

Faculty: Department of Anatomy is enriched with full-time dedicated, qualified and experienced faculty for teaching of undergraduate courses.

S No	**Name**	**Designation** **PMDC NO.**
1.	Dr. Ayesha Yousaf	Professor/ HOD Dean Basic Sciences 32049-P
2.	Dr Ifra Saeed	Professor Director DME 23561-P
3.	Dr Saima Naz	Professor 31919-P
3.	Dr. Mothashim Hina	Associate Professor 56959-P
4.	Dr. Arsalan Manzoor Mughal	Associate Professor Managing Editor JRMC Co-Director CHPE & MHPE 49901-P
5.	Dr. Maria Tasleem	Assistant Professor 51363-S
6.	Dr. Minahil Haq	Demonstrator 56794-P

Location: Anatomy department is located in the old campus of Rawalpindi Medical University, Tipu Road, Rawalpindi.

Details of Undergraduate Courses

The department caters to teaching and training of over 1000 undergraduate and postgraduate students in the following disciplines.

MBBS

- 1st Year (376 students)
- 2nd Year (374 students)

B.Sc and Allied Health Sciences

- **1st Year** (124 students)
    - Optometry
    - Orthotics
    - Doctor of physiotherapy
    - Medical Imaging Technology(MIT)
    - Medical Laboratory Technology(MLT)

- **2nd Year** (80 Students)
    - Doctor of physiotherapy
    - Optometry

B.Sc Nursing

- 1st Year (250 students)

Diploma in Medical Jurisprudence (7 postgraduate students)

SECTION-III

INFRASTRUCTURE

The department is located on the, first floor of University building and consists of the following:

- Air Conditioned Lecture halls with Audio Visual facility.
- One cadaver dissection hall and body preservation area.
- State of the art Histology Laboratory - fully equipped with over 50 microscopes
- Museum/Model Room – comprising a collection of anatomy models and carefully selected x-ray, CT and MRI films which are available for student learning activities.
- Embalming services are also available in the department
- Research Laboratory.

Basic Requirements For MD Anatomy Program

S #	PARAMETER	REQUIRED	SPECIFICATION/CAPACITY	ACTUAL / OBSERVED
1	**Offices** a) Teaching Staff b) Administrative Staff	a) 5 Minimum b) 2 Minimum	5-Senior faculty members including Professor, Associate and Assistant Professors	Yes
2	Seminar/meeting room	1	25 Capacity	Yes
3	Refreshment/tea room	1	20 Capacity	Yes
4	Library for PG Students	1	a) 20 Capacity b) Equipped with at least 3 computers with internet access c) For two PG students at least one recommended	Yes

			Anatomy book d) Availability of indexed journals	
5	Histology Laboratory	1	Optimum space for equipment and researchers with an area not less than 1000 sq ft	Available
6	Dissection Hall	1	Optimum space for dissection and mortuary with an area not less than 500 sq ft	Available
	Museum	1	Comprising a collection of anatomy models and carefully selected x-ray, CT and MRI films which are available for student learning activities	
7	Sample Collection/Patient Access		A tertiary hospital with minimum of daily 200 outdoor patients	Available
8	Animal Research Facility/Laboratory	1	a) Animal House Rooms: 2 min with temperature and humidity monitor b) Office for Veterinary officer c) Designated space for house attendant d) Changing area e) Procedure room with proper OT light f) 01 Colony breeding Room	In process

			g) Cage washing area h) Feed preparation/storage room i) Corridor to accommodate extra cage racks	

SECTION-III-C

EQUIPMENT

EQUIPMENT AVAILABLE IN DEPARTMENT

ANATOMY RESEARCH LABORATORY

S No.	Name of item	Issue date	Code
1.	Tissue Processor	10-11-1992	AD-RL-TP-1992-1
2.	Microtome	17-09-1997	AD-RL-MT-1997-1
3.	Tissue floating bath	02-05-2006	AD-RL-TB-2006-1
4.	Slide warmer	02-05-2006	AD-RL-SW-2006-1
5.	Incubator	02-01-1998	AD-RL-IB-1998-1
6.	Animal weigh machine	28-06-2008	AD-RL-AM-2008-1
7.	Shacking machine	12-12-1993	AD-RL-SM-1993-1
8.	Freezer	22-08-2020	AD-RL-FZ-2020-1
9.	Centrifuge	12-12-1993	AD-RL-CF-1993-1

ANATOMY NEW RESEARCH LABORATORY.

S No.	Name of item	Issue date	Code
1.	Auto Clave	30-05-2023	AD-RL-AC-2023-1
2.	Hot Air Owen	10-11-2023	AD-RL-HAO-2022-1
3.	Large sized Freezer (double door)	04-07-2023	AD-RL-FD-2023-1
4.	Large sized Freezer (double door)	04-07-2023	AD-RL-FD-2023-2
5.	Large sized Freezer (double door)	04-07-2023	AD-RL-FD-2023-3
6.	Large sized Freezer (double door)	04-07-2023	AD-RL-FD-2023-4
7.	Stereo microscope	04-07-2023	AD-RL-SM-2023-1
8.	Dissecting instrument	10-11-2022	AD-RL-DI-2022-1---10

S. No.	MUSEUM (ANATOMY)	Present
2.14	15 torsos (Male and Female) model available, functional and in use.	16
2.15	2 cross sectional torso model available, functional and in use.(optional)	2
2.16	13 upper limbs (muscles, vessels, nerves and joints) anatomical model available, functional and in use.	20
2.17	13 lower limbs (muscles, vessels, nerves and joints) anatomical model available, functional and in use.	19
2.18	16 head and neck (muscles, vessels, nerves and joints) anatomical	20

	model available, functional and in use.	
2.19	16 special senses anatomical model available, functional and in use.	18
2.20	20 brain anatomical model available, functional and in use	25
2.21	3 histology models available, functional and in use	20
2.22	3 embryology models available, functional and in us	53
2.23	13 pelvis models available, functional and in use.	26
2.24	14 abdominal viscera models / prosected segments available, functional and in use.	21
2.25	14 liver models / prosected segments available, functional and in use.	14
2.26	14 kidney models / prosected segments available, functional and in use	14
2.27	11 CVS models / prosected segments available, functional and in use.	14
2.28	14 respiratory system models / prosected segments available, functional and in use.	14
2.29	350 human's loose bones available, functional and in use.	1878
2.30	12 articulated skeletons available, functional and in use.	7
2.31	5 articulated vertebral column available, functional and in use	5
2.32	2 cross sectional body model available, functional and in use. (optional)	2
2.33	Anatomy CDs available, functional and in use. At least one multimedia available, functional and in use At least two white boards available, functional and in use	 3 13

HISTOLOGY LABORATORY EQUIPMENT

S.No	HISTOLOGY (ANATOMY)	Present
2.6	4 histology slide sets available, functional and in use	**4**
2.7	52 binocular microscopes available, functional and in use	**63**
2.8	One slide projecting microscope/ one penta-head Multi - viewing Biological Microscope available, functional and in use	**1/2**
2.9	2 large refrigerator available, functional and in use	**2**
2.10	The department may have at least one computer with internet facility available, functional and in use. (Optional)	**1**
2.11	The department may have at least 3 scanner available, functional and in use. (Optional)	**1**
2.12	The department may have at least 3 colour laser printer available, functional and in use. (Optional)	**1**
2.13	The department must have at least 100 stools available, functional and in use.	**100**

LIST OF BOOKS

Total Anatomy Books: 3236

Total Anatomy Titles: 73

S.No	Title of Books received in 2023	Author	Quantity
01	*Grays Anatomy for Students (First South Asia Edition)*	*Drake, Richard L*	*15*
02	*Grays Anatomy (41st Edition)*	*Standring*	*12*
03	*Human Embryology (02nd Edition)*	*Laiq Hussain Siddiqui*	*50*
04	*General Anatomy (4th Edition)*	*Laiq Hussain Siddiqui*	*20*
05	*Clinical Neuroanatomy (07th Edition)*	*Snell Richard. S*	*15*
06	*Oral Anatomy Histology & Embryology (05th Edition)*	*Berkovitz,B.K*	*03*
07	*Ten Caste's oral Histology (First South Asia Edition)*	*Nanci,Antonio*	*05*

SECTION-IV

CRIETERIA FOR ADMISSION

Eligibility Criteria

- MBBS or equivalent degree from an institution recognized by PMDC with minimum score of 60% and above
- One year internship with six months in Medicine and Allied and six months in Surgery and Allied disciplines
- MDCAT examination and allocation per Central Induction Government of Punjab

SECTION-V

PROGRAM SPECIFICATION– MD ANATOMY

COURSE OUTLINE

The MD program shall extend over a period of four years.

During the Four years of MD, students will have to complete their course work which is the minimum criteria. The course work will comprise of:

1. Compulsory courses and mandatory workshops for all the students irrespective of their field of specialty
2. Compulsory rotation according to the topic of research
3. Research work
4. Core courses specific for each specialty

PROGRAM SPECIFICATION

Course Title		MD Anatomy
Course Duration		04 Years
Type Of Study		Full Time
Study System		Annual
YEAR	**YEAR CODE**	
I.	ANT 01	
II.	ANT 02	
III.	ANT 03	
IV.	ANT 04	

Study weeks per year	36 weeks
Prep leave	2 weeks
Examination	1 week
Year break	1 week
Working days	8:00 am - 2:00pm (except Friday)

COMPULSORY COURSES

S. No	COURSE TITLE	COURSE CODE
1	Computer Skills	CS 01
2	Research Methodologies	RM 01
3	Biostatistics	BS 01
4	Bioethics/Medical Ethics, Medical Education	BE/ME 01 Med
5	Mandatory Workshops	-

MINOR COURSE

- Histopathology (HP 03)
- Clinical Rotations (CR-ANT)
  - Surgery
  - Pediatrics
  - Radiology
  - Gynae/Obstetrics
  - Orthopedics

CORE COURSES

Sr No	COURSE TITLE	COURSE CODE
1	Gross Anatomy I • Upper Limb • Lower Limb • Thorax	GA 01
2	General Anatomy	GNT 02
3	Microscopic Anatomy (Histology)	MA 02
4	Micro techniques	MT 02
5	Gross Anatomy II • Abdomen and Pelvis • Head & Neck	GA 02
6	Developmental Anatomy (Embryology)	DA 03
7	Neuroanatomy	NA 03

Framework of MD Anatomy Program

YEAR	TITLE OF COURSE
1ST YEAR	**COMPULSORY COURSES** ➢ Computer Skills ➢ Medical Education **CORE COURSES** **Gross Anatomy** • Upper limb • Lower limb • Thorax **MANDATORY WORKSHOPS** **1.** Vision & Time Management=3days **2.** Research methodology and Medical/Synopsis writing=3 days workshop **3.** Literature search and selection of research topic

	=1 days workshop=6 hours b.Computer Skills=1 days workshop=6 hours c.Reference citation (End Note, Mendeley)=2 days=12 = hours **JOURNAL CLUB RESEARCH AND SYNOPSIS (Selection of Topic)** • Clinical Rotation to Surgery • Clinical Rotation to Orthopeads
	COMPULSORY COURSES ➢ Biostatistics ➢ Medical and bio ethics **CORE COURSES** ➢ General Anatomy

2nd YEAR	➢ Microscopic Anatomy ➢ Microtechnique ➢ Gross Anatomy • Abdomen and Pelvis • Head and Neck **MANDATORY WORKSHOPS** • Animal handling/bioethics=8 hours • Grant application=4 hours Medical Education : ➢ Leadership and communication skills=6 hours= day 1 ➢ Interactive lectures=3 hours & Small group discussion (SGD)=3 Hours=day 2 How to attempt postgraduate SAQs=6 hours= day 3 ➢ Assessment tools(Objectively structured practical examination OSPE, Multiple choice questions MCQs)=3 hours= day 4

	• **JOURNAL CLUB RESEARCH AND SYNOPSIS** (Synopsis writing will be done along with the approval by ethical review board / university research board) • Clinical Rotation to Radiology

3rd Year	**CORE COURSES** ➢ Development Anatomy ➢ Neuroanatomy **MANDATORY WORKSHOPS** • Basic and Advance Statistical analysis **Journal Club Research Work** • Clinical Rotation to Pediatrics • Clinical Rotation to Gynae/Obs • Rotation To Histopathology
4th Year	**RESEARCH AND THESIS WRITING** **MANDATORY WORKSHOPS** • Article writing • Thesis writing • **JOURNAL CLUB**

DETAILS OF COURSE WORK

EDUCATIONAL METHODOLOGIES

1. Interactive Lectures
2. Small group discussions
3. Presentations
4. Demonstrations
5. Dissections
6. Assignments
7. Seminars
8. Tutorials
9. SDL
10. PBL
11. Case based learning

YEAR - I

YEAR- I

ANT 01

Duration **36 weeks**

Compulsory Courses

I.Computer Skills (Cs 01)

Teaching Strategy – Hands On Workshop

COURSE OBJECTIVES:

Upon completion of course the students will be able to:

1. Develop basic skills in operating computer in the mentioned softwares.

2. Comprehend the basic principles of presenting scientific data at national and international platforms using computer and IT technology

COURSE CONTENTS:

The course contents will include:

Programme Microsoft:

- Word
- Power point
- Excel

RECOMMENDED READINGS:

1. Hochreiter, Sepp; Wagner, Roland. Bioinformatics Research and Development. Series Lecture notes in Computer Science, Springer, Latest Ed.
2. Mandoiu, Ion; Narasimhan, Giri; Zhang, Yanqing. Bioinformatics Research and Applications Series: Lecture Notes in Computer Science. Springer, Latest Ed

JOURNALS:

1. Journal of Bioinformatics and Computational Biology (JBCB)
2. BMC Bioinformatics

II. Research Methodology

(Rm 01)

Course Description:

Research Methodology is a hands on course designed to impart education in the foundational methods and techniques of academic research in social sciences and business management context. Research scholars would examine and be practically exposed to the main components of a research framework i.e., problem definition, research design, data collection, ethical issues in research, report writing, and presentation. Once equipped with this knowledge, participants would be well
placed to conduct disciplined research under supervision in an area of their choosing. In addition to their application in an academic setting, many of the methodologies discussed in this course would be similar to those deployed in professional research environments.

COURSE OBJECTIVES:

The primary objective of this course is to develop a research orientation among the scholars and to acquaint them with fundamentals of research methods. Specifically, the course aims at introducing them to the basic concepts used in research and to scientific social research methods and their approach. It includes discussions on sampling techniques, research designs and techniques of analysis

At the end of the course the students should be able to

1. To develop the basic framework of research process
2. To develop an understanding of various research designs and techniques
3. Identify various sources of information for literature review and data collection
4. Elaborate ethical dimensions of conducting applied research
5. Appreciate the components of scholarly writing and evaluate its quality.

COURSE CONTENT

S No	TOPIC
1.	Introduction to research – The role of research, research process overview
2.	Philosophies and the language of research theory building Science and its functions, What is theory? and the meaning of methodology
3.	Thinking like a researcher – Understanding Concepts, Constructs, Variables, and Definitions
4.	Problems and Hypotheses – Defining the research problem, Formulation of the research hypotheses, The importance of problems and hypotheses
5.	Research design – Experimental and Non experimental research design, Field research, and Survey research
6.	Methods of data collection – Secondary data collection methods, qualitative methods of data collection,

	and Survey methods of data collection
7.	Attitude measurement and scaling – Types o measurement scales; Questionnaire designing – Reliability and Validity
8.	Sampling techniques – The nature of sampling, Probability sampling design, Non-probability sampling design, Determination of sample size
9.	Processing and analysis of data
10.	Ethical issues in conducting research
11.	Report generation, report writing – Title page, Abstract, Introduction, Methodology, Results, Discussion, References, and Appendices

Core Courses
I-Gross Anatomy I (GA 01)

Upper Limb
Learning Objectives

Upon completion of course the students should be able to:

1. Understand and interpret the gross structure of various parts of the upper limb
2. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the upper limb
3. Assess the anatomy of common incisions
4. Apply the knowledge to solve clinical problems related to Upper Limb Anatomy

COURSE CONTENT

S. No.	Topics
1.	Introduction to Anatomy Department
2.	General introduction and sub divisions of Anatomy
4.	Introduction to planes, axis & movements of human body
5.	Types of movements and their mechanics
6.	Structures met in dissection langers & cleavage lines , Fascia, tendons, aponeurosis and raphe
7.	Ligaments, capsules, synovial membrane, sheaths and bursae
8.	Somatic and A.N.S. common spinal nerve & its root value. Ganglia & their types.
9.	Referred pain, dermatomes myotomes and antigravity muscles
10.	Introduction to surface Anatomy, Radiology and Dye injection
11.	Clavicle
12.	Scapula
13.	Humerus
14.	Pectoral girdle & clavipectoral fascia
15.	Muscles acting on pectoral girdle
16.	Joints of pectoral girdle
17.	Movements of scapula
18.	Scapular muscles and intermuscular spaces
19.	Brachial plexus
20.	Injuries of brachial plexus
21.	Breast
22.	Lymphatic drainage of Breast with clinicals
23.	Axilla-1: (Boundaries and contents)
24.	Axilla II: (Lymph nodes)
25.	Axilla III : (Vessels and Anastomosis around Scapula)

26.	Shoulder joint

27.	Rotator cuff and clinical anatomy of shoulder joint
28.	Flexor compartment of arm (muscles)
29.	Flexor compartment of arm (vessels and nerves)
30.	Extensor compartment of arm (muscles, vessels and nerves)
31.	Ulna
32.	Radius
33.	Radioulnar joints / elbow joint
34.	Cubital fossa and anastomosis around elbow joint
35.	Flexor compartment of forearm (muscles)
36.	Flexor compartment of forearm (nerve and vessels)
37.	Extensor compartment of forearm (muscles)
38.	Extensor compartment of forearm (nerve and vessels)
39.	Articulated hand
40.	Dorsum of hand
41.	Retinacula of hand, anatomical snuff box and carpel tunnel syndrome
42.	Wrist joint with clinical anatomy
43.	Intrinsic muscle of hand and palmar aponeurosis
44.	Neurovascular organization of hand –I
45.	Neurovascular organization of hand –II
46.	Radial and ulnar bursae, synovial sheath and spread of infection
47.	Joints of hand
48.	Palmar digital spaces and dorsal digital expansion
49.	Venous and lymphatic drainage of upper limb
50.	Dermatomes and cutaneous innervations of upper limb
51.	Clinical anatomy (nerve injuries)

LOWER LIMB

COURSE OBJECTIVES

1. Understand and interpret the gross structure of various parts and regions of the lower limb
2. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the lower limb
3. Assess the anatomy of common incisions

4. Apply the knowledge to solve clinical problems related to lower Limb Anatomy

COURSE CONTENT

S. No.	**Topics**
1.	General introduction and sub divisions of Anatomy
2.	Introduction to planes, axis & movements of human body
4.	Types of movements and their mechanics
5.	Structures met in dissection langers & cleavage lines , Fascia, tendons, aponeurosis and raphe
6.	Ligaments, capsules, synovial membrane, sheaths and bursae
7.	Somatic and A.N.S. common spinal nerve & its root value. Ganglia & their types.
8.	Referred pain, dermatomes myotomes and antigravity muscles
9.	Introduction to surface Anatomy, Radiology and Dye injection
10.	Topography of lower limb
11.	Hip bone
12.	Femur
13.	Anterior compartment of thigh (vessels, nerves and lymph nodes, fascia lata and patella)
15.	Femoral triangle, femoral sheath and hernia
16.	Medial compartment of thigh (muscles, blood vessels and nerves)
17.	Adductor canal
18.	Superficial veins, great saphenous vein
19.	Gluteal region
20.	Hamstring muscles
21.	Back of thigh (nerves and vessels)
22.	Popliteal fossa
23.	Hip joint
25.	Tibia
26.	Fibula
27.	Tibiofibular joints
28.	Knee joint
29.	Anterior compartment of leg
30.	Posterior compartment of leg
31.	Lateral compartment of leg
32.	Dorsum of foot
33.	Ankle joint
34.	Venous and lymphatic drainage of lower limb
35.	Dermatomes and cutaneous innervations of lower limb
36.	Articulated foot / talus calcaneus
37.	Layers of foot (muscles, nerves and vessels)
38.	Arches of foot
39.	Joints of foot

40.	Inversion and eversion of foot
41.	Walking mechanism
42.	Radiology, surface and applied anatomy

THORAX

COURSE OBJECTIVES

1. Understand and interpret the gross structure of various parts of the thorax
2. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the thorax
3. Assess the anatomy of common incisions
4. Apply the knowledge to solve clinical problems related to Anatomy

COURSE CONTENT

S. No.	Topics
1.	Sternum, 1^{ST} rib and attachments
2.	2^{nd} rib and typical ribs
3.	Thoracic cage, vertebrae and joints (Typical & atypical)
4.	Thoracic inlet and outlet, Diaphragm, respiratory movements
5.	Walls of thorax and intercostals spaces
6.	Thoracic cavity, pleura
7.	lungs, broncho pulmonary segments (arterial supply venous drainage and nerve supply)
8.	Mediastinum and its sub division, Superior mediastinum and its boundaries contents arch of aorta in detail
9.	Mechanism of respiration,
10.	Inferior mediastinum, Pericardium
11.	Heart, external features
12.	Heart with nerve supply, blood supply and clinical
13.	Posterior mediastinum trachea, bronchi, oesophagus,
14.	superior vena cava descending aorta, inferior vena cava, pulmonary trunk
15.	Azygos system of veins, thoracic duct and thymus
16.	Sympathetic chain and lymphatic drainage of thorax
17.	Radiology and surface anatomy

RECOMMENDED READINGS:

1. Snell. R.S. Clinical Anatomy for Medical Students. Philadelphia USA Llippincot Williams and Wilkins: Latest Ed.
2. Sinnatamby C.S.Lasts Anatomy Regional and Applied London, Churchill Living Stone: Latest Ed.
3. Williams, P.L. Bannister, L.H. Berry, M.B, Collins, P., Dyson M. Ferguson, M.WJ. Gray's Anatomy London. Churchill living stone: Latest Ed.
4. Moore K.L. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins: Latest Ed

Journals:

1. Journal of Anatomy
2. Anatomy and Embryology
3. Anatomia, Histologia, Embryologia

End of First Year Assessment

1. Internal Assessment / Log book / Portfolio, Test 30%
2. End Year Examination
   a. Written Examination 40%
      i. MCQ's 50 marks
      ii. SEQ's 50 marks
3. Table of Specifications
   a. Written Examination

Sr No	COURSE CODE	COURSE TITLE	MCQ (1 Mark each)	SAQ (10 marks each)
1	GA 01	Gross Anatomy I • Upper Limb • Lower Limb • Thorax	 15 15 20	 2 2 1
		Total	50 marks	50 Marks

3. Calculate GPA as per University rules.

YEAR - II

Year- II
(Ant 02)
Duration 36 Weeks

Compulsory Courses

I. Bio Statistics (BS 01)

Course Objectives

Upon completion of course the students will be able to comprehend basic knowledge of epidemiology and will be able to:

1. Define epidemiology and know the principles of various study designs
2. Know how to design a study and describe the validity and reliability of a study design
3. Know the fundamental concepts and methods of statistics in the areas of medical and biological research
4. Have good command on use of statistical computer software for data analysis
5. Approaches for data analysis, Parametric, non-parametric and Semi-parametric methods, Qualitative Methodologies and Interpretation of results, validity of conclusions.
6. Identify research problems with literature review.
7. Formulation of research objectives
8. Learn Data collection techniques and sampling, planning for data collection, collation and analysis.
9. Planning for pilot study followed by main study along with Budget making and plan for dissemination.
10. Identify and define the basic concepts and procedures required for data analysis and interpretation.
11. Analyse and interpret the data collected for the research project and draw conclusions related to the objectives of your study.
12. Write a clear and concise research report (paper for a peer reviewed journal) and a summary of the major findings and recommendations for each of the different parties interested in the results.

13. Present the major findings and the recommendations of your study to policy-makers managers and to the subjects of your research together with them to finalise the recommendations.
14. Prepare a plan of action for the dissemination, communication and utilisation of the findings and (if required) make recommendations for additional research.

COURSE CONTENTS:

S No.	Topics
1.	Descriptive epidemiology, analytic epidemiology and epidemiological inference,
2.	Classification, morbidity and mortality rates, ratios, incidence, prevalence, sampling, screening, epidemiological models,
3.	Types of study design; their importance, uses, and limitations, field trials, controlled Epidemiological surveys, sources of bias and causal models.
4.	Introduction to statistics, types of statistical applications, population and samples, data analysis and presentation, variables, elementary statistical methods, tabulation, chart and diagram preparations, measures of central tendency and dispersion, sampling techniques and sample size estimation, probability and proportions,
5.	Tests of significance; normal test, t test, Chi square test etc, correlation and its applications, linear regression and multiple regression, Clinical trials and intervention studies,
6.	Measures for developing health statistical indicators: morbidity and mortality statistics, Use of latest statistical computer software for data analysis.

RECOMMENDED READINGS:

1. Gordis, L. Epidemiology. Pennsylvania: W.B. Saunders Company. Latest Ed.
2. Rothman KJ. Modern Epidemiology. Boston: Little, Brown and Company, Latest Ed.
3. Kelsey JL, Thompson WD, Evans AS. Methods in Observational Epidemiology. New York: Oxford UniversityPress, Latest Ed.

4. Kleinbaum DG, Kupper LL, Morgenstern H. Epidemiologic Research: Principles and Quantitative Methods. Belmont, CA: Lifetime Learning Publications, Latest Ed.
5. Lilienfeld DE, Stolley PD. Foundations of Epidemiology. New York: Oxford, Latest Ed.
6. Daniel WW. Biostatistics: A Foundation for Analysis in the Health Sciences. Latest Ed. John Wiley & Sons.Inc. New York.
7. Larson R and Farber B. Elementary Statistics: Picturing the World. Latest Ed, Prentice Hall Publications.NewJersey USA.
8. Oliver, M. and Combard MS. Biostatistics for Health Professions. Latest Ed. Prentice Hall Publications, NewJersey USA.
9. Statistical Software: SPSS; EPIINFO; STATA; SAS
10. Material provided as Health Services Course

JOURNALS:

1. Cancer Epidemiology
2. Pidemiologic Reviews
3. Annals of Epidemiology
4. American Journal of Epidemiology
5. International Journal of Epidemiology

II. BIO ETHICS/MEDICAL ETHICS (BE/ME 02)

COURSE DESCRIPTION

The **ethics curriculum** is designed to provide students with the conceptual tools that they will need to navigate the **ethical** issues that are commonly encountered in clinical practice. Program helps students to develop skills in critical reasoning and in using the basic concepts of medical ethics it also fosters the habits of critical reflection and discussion about the ethical issues.

Thorough exploration of ethics is critical to developing exemplary scholars and teachers. Focusing on discussion, curriculum considers central ethical and legal principles, and research ethics.

LEARNING OBJECTIVES

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

- Describe student responsibilities/ professionalism
- Enlist qualities of a physician
- Discuss codes of ethics
- Elaborate trust & fiduciary responsibility
- Describe importance of truth telling and informed consent for
- treatment
- Know confidentiality and the duty to warn
- Discuss ethical dangers of human subject research
- Describe importance of research and the development of new
- Therapies
- Elaborate the common rule: requirements for the ethical
- Conduct of research
- Explain justice in clinical practice
- State the right to health care
- Discuss allocation of transplant organs
- Describe concepts of autonomy
- Enlist standards for surrogate decision making
- Discuss refusal of treatment and justified paternalism
- Describe advance directives and proxies
- Explain
    a. Confidentiality and legal responsibility
    b. Adherence and compliance
- Geriatrics -giving bad news Analyze bioethics literature critically and comprehend the foundations of Bioethics theory
- Understand ethical issues regarding handling of research animals.
- Sacrifice research animals according to ethical principles.
- Comprehend basic knowledge of the ethical issues in biomedical research
- Comprehend ethical considerations in using animals for research experiments
- Prepare an animal model for research

- Exhibit attitude towards research on human volunteers, experimental animals and ethical aspects
- Understand 3 R rule regarding animals
- Learn the efforts to minimize the discomfort ,infection, illness and pain of animal subjects.
- Interpret the results and draw inference

COURSE CONTENT

S no.	Topic
1.	**Professional Responsibilities** ➢ Student Responsibilities/ Professionalism ➢ Qualities of a Physician/Codes of Ethics ➢ Should Patients Be Learning Tools
2.	**Central Ethical & Legal Principles** ➢ Duty to Provide Care (Trust & Fiduciary Responsibility) ➢ Truth Telling and Informed Consent for Treatment ➢ Confidentiality and The Duty to Warn
3.	**Research Ethics [Epidemiology]** ➢ Ethical Dangers of Human Subject Research ➢ The Importance of Research and The Development of New Therapies ➢ The Common Rule: Requirements for The Ethical Conduct of Research
4.	**Justice and Medicine** ➢ Justice in Clinical Practice ➢ The Right to Health Care ➢ Allocation of Transplant Organs
5.	**The Nature and Value of Autonomy** ➢ Concepts of Autonomy ➢ Concept of beneficence ➢ Concept of Non-maleficence ➢ Standards for Surrogate Decision Making ➢ Refusal of Treatment and Justified Paternalism ➢ Advance Directives and Proxies
6.	**Clinical Moral Reasoning: A Systematic Approach to Clinical Ethics Dilemma** ➢ Critical Care -Family Meeting ➢ Emergency Medicine - Confidentiality and Legal Responsibility ➢ Family Practice -Adherence and Compliance ➢ Geriatrics -Giving Bad News ➢ Medicine -Responding to Families ➢ Neurology -Disclosing a Diagnosis ➢ Ob/Gyn-Reproductive Choice

	➢ Pediatrics -Parental Discretion ➢ Psychiatry -Treatment over Objection and Confidentiality ➢ Surgery -Identifying Ethical Issues
7.	**Animal Handling Research ethics** ➢ Reproduction and fertility; ➢ Genetics and the human future. ➢ Animal preparation and experiments of laboratory animals, ➢ Maintenance of animal house; ➢ Routine physiology experiments on animals and humans. ➢ Animal rights in experimentation.

EDUCATIONAL METHODOLOGY

- Interactive lectures
- Group Discussions
- Assignment
- Seminars

RECOMMENDED READINGS

- Beauchamp, J. (2013). "Principles of Biomedical Ethics". Principles of Biomedical Ethics. 7.
- World Medical Association. http://www.wma.net. Principal features of medical ethics [archived 4 March 2016; Retrieved 3 November 2015].

JOURNALS

- British Medical Journal.
- The Medical Journal of Australia

III. MEDICAL EDUCATION (MEd 01)

COURSE OVERVIEW AND DESCRIPTION:

The whole course is based on principles of constructive cognitive philosophy and follows the FAIR criteria to improve learning. According to constructive philosophy the teacher is more than a transmitter of information and has responsibility for managing the student's learning. The reflective teacher has an understanding of the principles of learning. Hence, this course has four key features identified for effective learning – the FAIR criteria:

Course is designed for the post graduate medical students to develop them as an effective team member and effective teacher in an Integrated Curriculum development, its implementation and evaluation.

The students will understand and apply the basic core concepts in medical education while working as Task Force member, conducting an integrated session for instance '**Problem based Learning Sessions' etc** and assessing the students**.** The essential Core area in which students will be trained are 1) educational environment & students, 2) teaching and learning strategies, 3) curriculum development including educational strategies & curriculum themes, 4) Students assessment and 5) Program evaluation. The course curriculum is structurally organized in these**.**

LEARNING OBJECTIVES

1. Introduce with the themes of HPE, trend, Issues & Challenges IN HPE & Competencies required in HPE.
2. Discuss the competencies of a Medical Teacher.
3. Identify the factors which constitute the educational environment and effect the students learning i.e. the factors that enhance or inhibit the learning.
4. Identify various learning styles, its merits and demerits- superficial and deep learning.
5. Identify the characteristics of adult learners, and the principles of adult learning.
6. Link principles of adult learning with characteristics of modern curriculum.
7. Identify different modes of instruction and its strength and weakness.
8. Use the process of planning while designing & conducting large group teaching (Interactive lectures) session.
9. Use the process of planning while designing & conducting small group discussion session.
10. Discuss the principles process, role of tutors and students, student's assessment in a PBL & CBL session.
11. Demonstrate effective communication skills (active participation, Proactiveness, professionalism, group dynamics, team building, conflict resolution, negotiation skills, leadership skills etc) while working in the group/team tasks.
12. Define curriculum.
13. Differentiate between the different components of a curriculum.

14. Enlist Harden's 10 questions for curricular planning & WFME standards
15. Discuss various curricular philosophies & Perspectives - curricula past, present, future.
16. Identify the trends in curriculum development, educational strategies and curriculum themes.
17. Discuss integrated curriculum and broad categories of integration in curriculum
18. Differentiate between the aims, goals, outcomes, objectives
19. Differentiate between the different levels in Bloom's taxonomy of objectives.
20. Write learning objectives of 3 different domains for an integrated module and match it with the teaching and learning strategies.
21. Elaborate steps of Integrated Modules planning & development
22. Select core content while designing an integrated curriculum development.
23. Differentiate between assessment and evaluation
24. Differentiation between the formative & summative assessment, Criterion referenced and norm referenced.
25. Discuss the characteristics of a good examination.
26. Match learning objectives with the assessment tools (Miller's Pyramid).
27. Construct various assessment tools e.g. MCQs, SEQ, OSCE/OSPEs,
28. Match the objectives with the assessment tools.
29. Develop a table of specification for a module.
30. Discuss the importance of evaluating a teaching session/ course/ program.
31. Identify the ways of assessing the effectiveness of an educational program.

COURSE CONTENT

S NO.	TOPIC
1.	Introduction to HPE and competencies required in HPE • Educational environment which effect the students learning- factors that enhance or inhibit the learning the learning. • Various learning styles and merits and demerits- superficial and deep learning.
2.	**Teaching & Learning** • The characteristics of adult learners- the principles of adult learning. • Different instructional methodology or modes of information transfer. • Teaching and Learning in large group: Interactive lecturing. Teaching and Learning in small groups teaching and learning: PBL, CBL why? How? Its principles, process – tutors and students role
3.	**Curriculums: structural concepts and development** • The curriculum and its components. • Various curricular philosophies & Perspectives- curricula past, present, future. • Innovative trends in curriculum, educational strategies and curriculum

	themes with emphasis on integration. • The Hardens 10 questions for curricular planning. • Differentiation between the aims, goals, outcomes, objectives • Writing Learning objectives and Levels in Bloom's taxonomy of objectives for a course.
4.	**Assessments** • Definition of assessment and evaluation. • Differentiation between the formative & summative assessment, Criterion referenced and norm referenced. • Characteristics of a good examination and definitions of validity and reliability of exams. • Matching of learning objectives with the assessment tools. • Design various assessment tools for knowledge, skill & attitude (MCQs, SEQ, & OSCE/OSPE) • Importance and Contents of a table of specification.
5.	**Program Evaluations** • Discuss the importance of evaluating a teaching session/ course/ program. • Identify the ways of assessing the effectiveness of an educational program.

RECOMMENDED READINGS

- Understanding medical education evidence theory and practice Twin Swanwick
- Achieving excellence in Medical Education Richard B Gunderman
- Oxford book of medical education
- Researching medical education by Jennifer Cleland and steven J Durning

JOURNALS

- Journal of medical education and curricula development
- International journal of medical education
- Journal of postgraduate medicine education and research

CORE COURSES

I. GENERAL ANATOMY (GNA 02)

COURSE OBJECTIVES:

Upon completion of course the students should be able to:

1. Understand and interpret the gross structure of various parts and regions of the human body
2. Understand the systematic and regional anatomy of the human body
3. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the human body
4. Assess the anatomy of common incisions
5. Apply the knowledge to solve clinical problems related to Anatomy

COURSE CONTENTS:

S No.	Topics
1.	Terms of positions and movements
2.	Classification, ossification and blood supply of bones
3.	Classification and structure of joints
4.	Classification of muscles
5.	General aspects of circulatory system
6.	General aspects of Integumentary system
7.	General aspects of nervous system

RECOMMENDED READINGS

1. Snell. R.S. Clinical Anatomy for Medical Students. Philadelphia USA Lippincot Williams and Wilkins: Latest Ed.
2. Sinnatamby C.S.Lasts Anatomy Regional and Applied London, Churchill Living Stone: Latest Ed.
3. Williams, P.L. Bannister, L.H. Berry, M.B, Collins, P., Dyson M. Ferguson, M.WJ. Gray's Anatomy London. Churchill living stone: Latest Ed.
4. Moore K.L. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins: Latest Ed.

JOURNALS:

1) Journal of Anatomy
2) Anatomy and Embryology
3) Anatomia, Histologia, Embryologia

II. MICROSCOPIC ANATOMY (HISTOLOGY) (MA O2)

COURSE OBJECTIVES

Upon completion of course the students should be able to:

1. Illustrate the microscopic structure of all the tissues and organs of the human body
2. Elaborate the functional correlation of the histological structure of clinically important tissues and organs
3. Describe the uses and applications of all types of microscopes.
4. Handle microscopes commonly used in research and histology labs Course Contents:

COURSE CONTENTS

Part-I

S No	Topics
1.	Introduction to different types of microscopes;
2.	Cell & its organelles and cell junctions;
3.	Epithelium and surface modifications;
4.	Connective Tissue;
5.	Cartilages;
6.	Bone, Bone marrow and blood cells;
7.	Muscular tissue;
8.	Nervous Tissue;
9.	Circulatory System;
10.	Lymphoid Organs;
11.	Integumentary system.
Part-II	
1.	Digestive system including associated glands;
2.	Respiratory System;
3.	Urinary System;
4.	Male Reproductive System;
5.	Female Reproductive System;
6.	Endocrine System;
7.	Organs of Special Senses.

RECOMMENDED READINGS:

1. Junqueira, L.C.Cameiro, J. Basic histology. California, U.S.A, Lange Medical publication: Latest Ed.
2. Kelly, D.E, Wood, R.L, Enders, A.C. Bailey's Text Book of Microscopic Anatomy. Baltimore, U.S.A, Williams and Wilkins: Latest Ed.
3. Burkit,H.G, Young, B, Heaith, J.W. Wheater's Functional histology London, Churchill living stone: Latest Ed.
4. Lesson, C, R, Lesson, T. S. Histology. Philadelphia .S.A, W. B. Saunders and Company Latest Ed.
5. Faucett, D.W.A Text Book of Histology. London, Chapman and hall: Latest Ed.
6. Williams, P.L.Bannister, L.H, Berry, M.B, Collins, P., Dysons M Ferguson, M.WJ. Gray's Anatomy .London, Churchill living stone: Latest Ed.

JOURNALS:

1. Clinical Anatomy
2. Archives of Histology and Cytology
3. International Journal of Developmental Biology
4. Anatomia, Histologia, Embryologia

III. MICROTECHNIQUES
(MT 02)

COURSE OBJECTIVES:

Upon completion of the course students should be able to:

1. Understand the phenomenon of fixation, dehydration, clearing, embedding.
2. Comprehend the knowledge of sectioning
3. Comprehend the knowledge of indications, procedures and correction of abnormal deviations of various staining methods.
4. Perform the above procedures

COURSE CONTENTS:

The course contents will include:

S No.	Topics
1.	Fixation of tissues: Phenomenon,
2.	Common fixatives used or available:
3.	composition, advantages and disadvantages of fixative.
4.	Clearing agents;
5.	Paraffin Embedding process;
6.	Sectioning Process:
7.	Microtomes and knives, their types and uses,
8.	Sharpenning of knives,
9.	Problems encountered and their remedies.
10.	Staining: Procedure, uses and interpretation of: Routine Haematoxylin and Eosin, Cresyl Violet for Nissl substance, Sudan Black B for Lipids, Mallory's connective tissue stain, Gomor's Aldehyde Fuchsin Stain for pancreas, Feulgen method for DNA, Periodic Acid Schiff (PAS) for glycogen, Modified Halmi's method for Pituitary gland, Some latest techniques.
11.	Mounting; Vital and supravital dyes and study of cells;
12.	Freezing microtome and frozen sections of fresh tissues;
13.	Microscopes: Components, phenomenon and uses of: Simple and compound optical microscopes, Florescent microscope, Polarizing microscope, Dark field microscope, Electron microscope; Micrometry; Microphotography; Maintenance of microscopes.

RECOMMENDED READINGS

1. Biological microtechnique by Sanderson
2. Hand book of basic microtechnique
3. Animal micrology
4. Microtechnique by Bancroft

JOURNALS

1. **Botanical microtechnique**

IV. GROSS ANATOMY II

(GA 02)
ANATOMY OF ABDOMEN AND PELVIS
COURSE OBJECTIVES:

Upon completion of course the students should be able to:

1. Understand and interpret the gross structure of various parts of the abdomen and pelvis
2. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the abdomen and pelvis
3. Assess the anatomy of common incisions
4. Apply the knowledge to solve clinical problems related to Anatomy

COURSE CONTENTS:

S No.	Topics
1.	Anterior abdominal wall, Rectus sheath
2.	Inguinal canal & hernia, Male external genitalia
3.	Peritoneal dispositions
4.	Oesophagus, stomach
5.	Small intestine, duodenum
6.	Small intestine, mesentery difference ileum and jejunum
7.	Large intestine and appendix
8.	Blood supply of the gut (Coeliac trunk, superior and inferior mesenteric artery)
9.	Liver
10.	Nerve supply of GIT and porto systemic anastomosis, portal hypertension
11.	Gall bladder and extra biliary apparatus
12.	Pancreas, spleen
13.	Kidney and supra renals and ureters
14.	Lumbar vertebra
15.	Aorta and inferior vena cava
16.	Posterior abdominal wall, (Thoraco lumbar fascia)
17.	Cistern chyli and lymphatic drainage of abdomen
18.	Lumbar plexus
19.	Sacrum and
20.	boney pelvis
21.	Pelvic peritoneum and pelvic diaphgram
22.	Urinary bladder, urethra
23.	Prostate, Seminal vesicles, Vas deferens, ejaculatory duct
24.	Uterus, Uterine supports,

25.	Ovary, vagina, Internal iliac vessels
26.	Rectum
27.	Sacral and cocygeal and hypogastric plexuses.
28.	Ischio rectal fossa
29.	Anal canal and applied Anatomy
30.	Urogenital diaphragm,
31.	Perineal pouches
32.	Lymphatic and venous drainage of pelvis and clinical aspects
33.	Radiograph
34.	Surface marking

ANATOMY OF HEAD & NECK

COURSE OBJECTIVES:

Upon completion of course the students should be able to:

1. Understand and interpret the gross structure of various parts of head and Neck
2. Identify the bones, joints, muscles, nerves, viscera and blood vessels in cross sections of the head and neck
3. Assess the anatomy of common incisions
4. Apply the knowledge to solve clinical problems related to Anatomy

COURSE CONTENTS:

The course contents will include:

S No.	Topics
1.	Skull (Norma frontalis &verticalis)
2.	Skull (Norma lateralis & norma basalis)
3.	Skull (Norma occipitalis)
4.	Cervical vertebra
5.	Scalp and temple
6.	Face
7.	Parotid region
8.	Submandibular region
9.	Infratemporal region
10.	Infratemporal region
11.	Mandible
12.	Temporo mandibular joint
13.	Nasal cavity
14.	Para nasal sinus
15.	Cervical fascia

16.	Hyoid bone, supra and infra hyoid muscles
17.	Thyroid and parathyroid gland
18.	External carotid artery
19.	Anterior triangle of neck
20.	Anterior triangle of neck
21.	Posterior triangle of neck
22.	Cervical plexus
23.	Root of neck
24.	Extra cranial course of 9^{th} & 11^{th} nerve
25.	Extra cranial course of 10^{th} & 12^{th} nerve
26.	Prevertebral region
27.	Joints of neck
28.	Pharynx
29.	Soft palate, auditory tube
30.	Pterygopalatine fossa
31.	Parasympathetic ganglia
32.	Tongue
33.	Larynx
34.	Orbit wall and its content
35.	Eye lid and lacrimal apparatus
36.	Eye ball
37.	Extra ocular muscles and movements
38.	External and middle ear
39.	Middle ear
40.	Internal ear
41.	Extra cranial course of 7^{th} and 8^{th} nerve
42.	Joints of neck
43.	Surface and radiological anatomy

RECOMMENDED READINGS

1. Snell. R.S. Clinical Anatomy for Medical Students. Philadelphia USA Lippincot Williams and Wilkins: Latest Ed.
2. Sinnatamby C.S.Lasts Anatomy Regional and Applied London, Churchill Living Stone Latest Ed.
3. Williams, P.L. Bannister, L.H. Berry, M.B, Collins, P., Dyson M. Ferguson, M.WJ. Gray's Anatomy London. Churchill living stone: Latest Ed.
4. Moore K.L. Clinically Oriented Anatomy. Baltimore, U.S.A. Williams and Wilkins: Latest

JOURNALS:

1. Journal of Anatomy
2. Anatomy and Embryology
3. Anatomia, Histologia, Embryologia

Mid Training Assessment

1. Internal Assessment / Log book / Portfolio 30%
2. End Year Examination
    a. Written Examination 40%
        i. MCQ's
        ii. SEQ's
    b. OSPE & VIVA 30%

3. Table of Specifications
    a. Written Assessment

Sr No	COURSE CODE	COURSE TITLE	MCQs (100 Marks)	SAQs (100 Marks)
1	GA 01	Gross Anatomy I • Upper Limb • Lower Limb • Thorax	 10 10 10	 1 1 1
2	GNT 02	General Anatomy	10	2
3	MA 02	Microscopic Anatomy (Histology)	20	2
4	MT 02	Microtechniques	10	1
5	GA 02	Gross Anatomy II • Abdomen and Pelvis • Head & Neck	 15 15	 1 1
		Total Marks	100 Marks	100 Marks

    a. Practical Assessment

Sr No	COURSE CODE	COURSE TITLE	OSPE (5 Marks per station)	Viva (100 Marks)
1	GA 01	Gross Anatomy I • Upper Limb • Lower Limb • Thorax	 2 2 3	 10 10 10
2	GNT 02	General Anatomy	-	10
3	MA 02	Microscopic Anatomy (Histology)	5	30
4	MT 02	Microtechniques	2	10
5	GA 02	Gross Anatomy II • Abdomen and Pelvis • Head & Neck	 3 3	 10 10
		Total Marks	100 Marks	100 Marks

4. Calculate GPA as per University rules.

YEAR- III

Year III

Duration= 36 Weeks

Developmental Anatomy (Embryology)
(DA 03)

Course Objectives:

Upon completion of course the students should be able to:

1. Describe and interpret general aspects of normal human development
2. Discuss the development of all systems of body
3. Discuss the mechanism, pathogenesis and clinical aspects of common congenital anomalies
4. Elaborate methods of In Vitro Fertilization and Cloning
5. Describe the gross and internal structure of various components of the nervous system including tracts and connections
6. Co-relate the anatomical knowledge of the nervous system with functions
7. Discuss the cross-sectional anatomy of various parts of the central nervous system
8. Have basic knowledge of common lesions and diseases related to the nervous system

Course Contents (Embryology)

The course contents will include:

Part I

S No.	Topics
1.	Introduction and history of embryology,
2.	Various terms of life span;
3.	Cell cycle, cell division & chromosomal abnormalities
4.	Gametogenesis (Oogenesis & spermatogenesis) & Ovarian Cycle;
5.	Fertilization, contraception & Cloning including religious and legal aspects;
6.	Menstrual cycle;
7.	Implantation & ectopic pregnancies;
8.	Embryonic period (Organogenesis);
9.	Fetal period;
10.	Fetal membranes & Placenta;
11.	Multiple pregnancies;
12.	Parturition;
13.	Birth defects & pre-natal diagnosis
Part II	
14.	Musculoskeletal system;
15.	Body Cavities,
16.	Mesenteries and Diaphragm;

17.	Cardiovascular System;
18.	Respiratory System;
19.	Digestive System;
20.	Urogenital System;
21.	Head& Neck and pharyngeal apparatus;
22.	Nervous System;
23.	Special senses (Eye & Ear);
24.	Integumentary System.

Recommended Readings

1. Moore and Persuad. The Developing Human. Philadelphia, U.S.A, W.B. Saunders and company, Latest Ed.
2. Saddler T.W. Langman's Medical Embryology. Philadelphia, U.S.A, Lippincott Williams & Wilkins, Latest Ed.
3. Williams, P.L. Bannister, L.H, Berry, M.B, Collins, P, Dyson M, Ferguson, M.W.J. Gray's Anatomy. London, Churchill Living stone: Latest Ed.

Journals

1. Congenital Anomalies
2. Anatomy and Embryology
3. Mechanisms of Development
4. Anatomia, Histologia, Embryologia
5. Development, Growth and Differentiation
6. International Journal of Developmental Biology
7. Birth Defects Research Part A: Clinical and Molecular Teratology
8. Birth Defects Research Part A: Developmental and Reproductive
9. Toxicology

Neuroanatomy
(Na 03)
Course Objectives
At the end of the course the student should be able to

1. Recognize all the skull bones and their features
2. Identify different parts of central Nervous system
3. Describe gross features and functions of different parts of central nervous system
4. Explain formation, circulation and importance of CSF
5. Appreciate neuronal connections of different parts of CNS
6. Discuss blood supply of different parts of brain and spinal cord
7. Describe applied anatomy of CNS

COURSE CONTENTS:

The course contents will include:

S.No	Topics
1.	Skull (Anterior cranial fossa)
2.	Skull (Middle and posterior cranial fossa)
3.	Meninges
4.	Cisterns
5.	Dural venous sinuses
6.	Spinal cord (Ascending tracts)
7.	Spinal cord (Descending tracts)
8.	Spinal cord (Clinical correlation)
9.	Base of brain, Circles of willis
10.	Medulla oblongata
12.	Pons
13.	Mid Brain
15.	Cerebellum
17.	4^{th} ventricle
18.	Diencephalon (Thalamus)
19.	Diencephalon (hypothalamus)
20.	3^{rd} ventricle
21.	Cerebral hemisphere(sulci, gyri)
22.	Cerebral hemisphere (cortical areas)
23.	White matter of cerebrum
24.	Basal Ganglia
25.	Lateral ventricle

26.	Circulation of C.S.F, blood supply of brain and venous drainage
27.	Reticular formation
28.	Limbic system
29.	Cranial nerve nuclei

Recommended Readings

1. Carpenter. M.B. Text book of Neuroanatomy. Baltimore, U.S.A, Williams and Wilkins: Latest Ed.
2. Snell. R.S. Clinical Neuroanatomy for Medical Students. Philadelphia, U.S.A. Lippincott Williams and Wilkins: Latest Ed.
3. Williams, P.L. Bannister, LH, Berry, M.B, Collins, P. Dyson M, Ferguson, M.WJ.
4. Grays Anatomy. London, Churchill Living Stone: Latest Ed.

Journals:

1. Muscle And Nerve
2. Mechanisms Of Development
3. Anatomia, Histologia, Embryologia
4. Development Growth And Differentiation
5. International Journal Of Developmental Biology

Assesment Procedure:

1. Internal Assessment / Log book / Portfolio 30%
2. End Year Examination
    a. Written Examination 40%
        i. MCQ's
        ii. SEQ's

Sr No	COURSE CODE	COURSE TITLE	MCQ (1 Mark per MCQ)	SAQ (10 Marks per SAQ)
1	DA 03	Developmental Anatomy (Embryology)	25	3
2	NA 03	Neuroanatomy	25	2
		Total	50 Marks	50 Marks

3. Calculate GPA as per University rules.

Histopathology

(HP 03)

Course Objectives

After studying this course, you should be able to:

1. Define all the terms
2. Outline key features of a number of pathological processes
3. Relate the histological appearance of affected tissues to the underlying pathology
4. Recognize the histological appearance of a number of pathological tissues
5. Understand how sections can be photographed, presented and reported.

COURSE CONTENT

S.No	TOPIC
1	Pathological processes-infection, inflammation
2	Pathological processes- neoplasm
3	Pathological processes-cell death
4	Photography and reporting

RECOMMENDED READINGS

1. Pathological Basis of Disease by Kumar, Cortan and Robbins, 7th Ed., W.B. Saunders.
2. Clinical Pathology Interpretations by A. H. Nagi

YEAR - IV

YEAR IV

Duration 36 Weeks

Research/Thesis Writing

The Thesis will be completed before the end of 4th year of the courses and is submitted for evaluation to assessors, two from within the country. Upon approval of the work by the assessors, the student is required to correct the Thesis to comply with the observation of the evaluators before it is submitted to the panel of examiners.

Evaluation of Students During Course

There will continuous evaluation of Post Graduate Trainees throughout the course by Supervisors, Mentors, and Students (Proformas Attached)

Final Team Assessment

Written Assessment

Sr No	COURSE CODE	COURSE TITLE	MCQ (1 Mark per MCQ)	SAQ (10 Marks per SAQ)
1	DA 03	Developmental Anatomy (Embryology)	25	3
2	NA 03	Neuroanatomy	25	2
		Total	50 Marks	50 Marks

Practical Assessment

Sr No	COURSE CODE	COURSE TITLE	OSPE (5 Marks each)	Viva
1	DA 03	Developmental Anatomy (Embryology)	5	25
2	NA 03	Neuroanatomy	5	25
		Total	50 Marks	50 Marks

Research Assessment

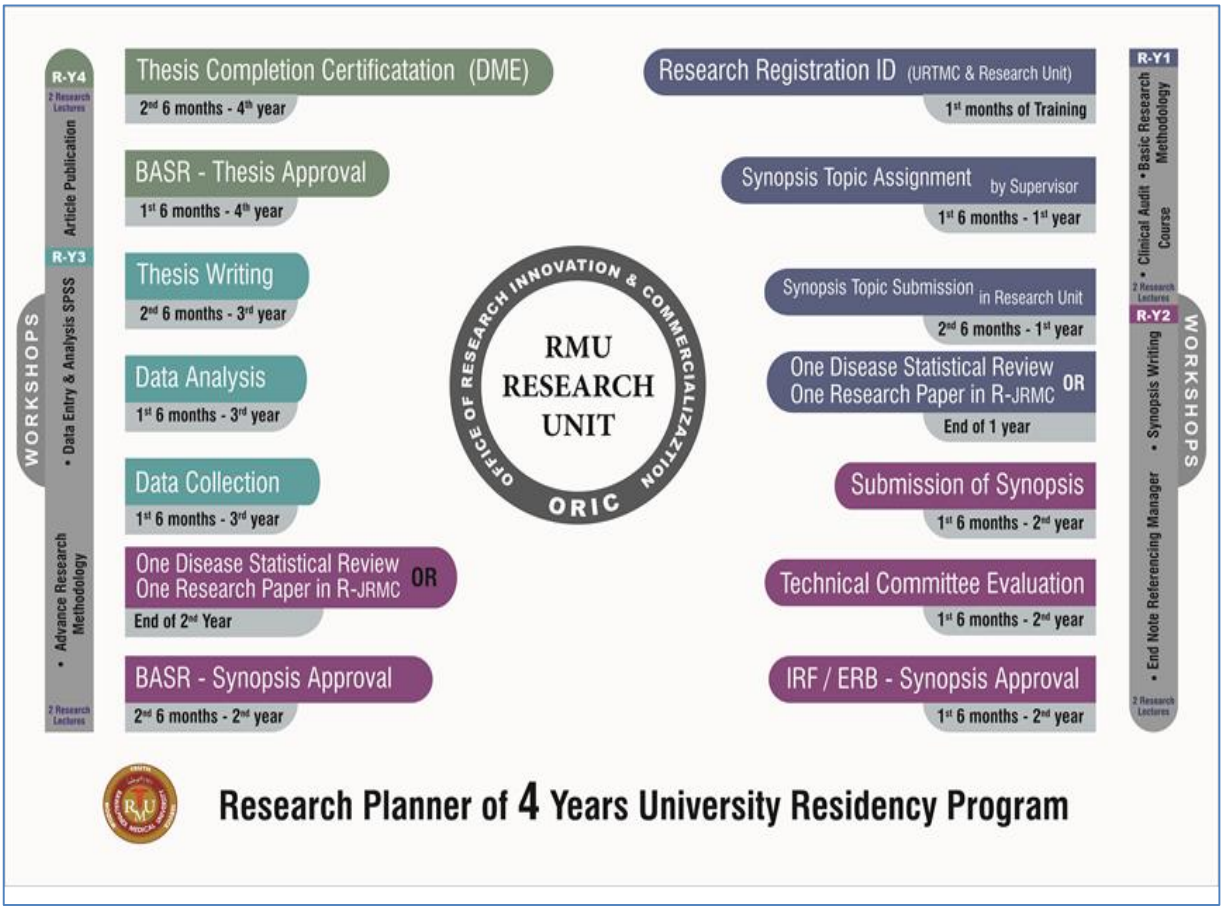
Thesis Defense- 100 Marks

SECTION VI

SYNOPSIS AND THESIS

SYNOPSIS AND THESIS

RMU Research Requirements



Guidelines for Synopsis

Synopsis is the brief out line of PGTs Planned Research Project submitted for approval from Ethics Review Committee. It gives a Panoramic view of PGTs Research for quick analysis by the Reviewers. M.D Research synopsis writing is an active part of the Academic Life of the Rawalpindi Medical University.

A Synopsis should be constructed in a manner that facilitates the Reviewer to understand the Research Project at a Glance. It should be brief but precise. A synopsis must have the following headings:

Title:

The Title of the Research Project should be brief but informative. It should reflect the objectives of the Study. It must be written after the whole synopsis has been written so that it is a true representative of the plan. It should neither be too short nor too long. It should not include any name of the institution or the number of cases to be studied.

Introduction:

It should provide a brief description of the selected topic. It must highlight the importance of study, Its relevance and applicability of results on General Population. The purpose of the study must be evidently stated in the introduction.

Hypothesis:

A Hypothesis is a statement which is to be tested for possible acceptance or rejection. It is mentioned as a tentative prediction or explanation of the relationship between two or more variables. Hypothesis are of two types i.e Null (Ho) And Alternative (H1). Null Hypothesis is tested for possible rejection, whereas alternative hypothesis is tested for possible acceptance. Hypothesis can be formulated by understanding the problem, reviewing the literature on it, and considering other factors. A Hypothesis is needed in the following study designs:

All Interventional Studies

Cohort

Case Control

Comparative Cross Sectional.

Aims and Objectives:

An objective is indication of what the researcher wants to study. It should be stated in clear measurable terms and should be itemized. The objectives and aims should be only a few (2-3). They must pertain to the study problem. Usages of terms like "First Study", "The Only Study", etc. should be avoided.

Operational Definition:

It may be required in some synopsis. It is the definition of the exposure and outcome variables of interest in context to objective in a particular study and their means of measurement/Determination.

Material and Methods:

Study Design:

Mention the name of the appropriate study design.

Setting:

Name and place where the research work is to be conducted

Duration of Study:

How long will the study take?

Sample Size:

How many patients will be included? If there are groups, then how many per group?

Sampling Technique:

Type of sampling technique employed.

Sample Selection:

Inclusion Criteria: On what basis will patients be inducted in the study?

Exclusion Criteria: On what basis will Patients be excluded from the study?

Data Collection Procedure:

A detailed account of how the researcher will perform research; How she/he will measure the variable. It Includes:

Identification of the Study Variables Methods

for Collection of Data

Data Collection Tools (Proforma/Questionnaire)

Variables:

Variables are the factors that can change. These changes can affect the outcome of a Research Project. Thus, it is important to identify the variables at the planning stage. They should be quantified with a measurable unit. Knowledge of the various variables in a research project will assist in refining the objectives. Usually, objectives of a research will be to see the effect of independent variables on dependent variables

Data Analysis Procedure:

Data analysis is an important part of a Research project. A good analysis leads to good results. Relevant details naming software to be used, which descriptive statistics and which test of significance if and when required, specifying variables where it will be applied. A general statement "Appropriate Statistical Methods Will Be Used" must be avoided.

Ethical Clearance:

Wherever necessary, ethical committee clearance from the institute should be obtained. The certificate must be attached. Ethical clearance is required in all human and animal studies.

Data Collection Instrument:

The researcher must attach, as an annex, the proforma or questionnaire with the help of which he/she intends to collect data. The proforma/questionnaire must match the objectives and must not contain irrelevant sections like inclusion and exclusion criteria etc.

Estimated Cost Of The Project:

It includes the funds required for all chemicals / reagents, laboratory equipment / materials or study animals (if any) to be utilized in the research needs.

Outcome & Utilization:

It describes the Way in which the expected results of your study can be useful in designing and delivery of health care system

References:

All references quoted in review of literature and anywhere else in the synopsis should be listed here. There are two styles for writing references, Vancouver style and Harvard style. Vancouver style is easy to follow as it depends on the numbers as quoted in text.

Process of Submission & Approval

Synopsis will be approved by university institutional research forum and ethical review board. Final approval will be given by university board of advance studies and research.

Guidelines for M.D Thesis

Thesis Format

The thesis is a document that contains relevant details of the research work conducted by the post-graduate trainee relating to the problem. It emphasizes on developing skills in post-graduate trainees for: collection and compilation of data, analyzing and reviewing relevant literature available on the subject& developing medical writing habits. A thesis must have the following headings:

Title page:

It must include the title (including subtitle), author, institution, department & date of delivery.

Supervisor's certificate:

A thesis is to be submitted for the purpose of examination. It must obtain prior declaration by the supervisor on the standard and quality of the thesis.

Acknowledgements:

The student may acknowledge the assistance of various individuals or organizations in-successfully producing the thesis. This should be written in one page.

List of symbols/abbreviations:

All symbols or abbreviations found in the text should be listed on this page in alphabetical order.

Table of contents:

The table of contents page must start on a new page. It should list all sections, chapters and sub-headings. The titles must be written using the same words as those written in the text.

List of tables:

This page should list all the tables found in the thesis. The page number of the table must also be included. The table numbers should be arranged according to the chapters.

List of figures:

Diagrams, photographs, drawings, graphs, charts and maps are included as figures. The list should be written similar as the list of tables.

List of appendices:

All appendices should be listed on this page.

Abstract:

A good abstract explains the importance of the research in one line. It then goes on to give a summary of your major results. The closing sentences explain the major inferences of your work. A good abstract is concise, readable, and quantitative. Length should be ~ 1-2 paragraphs, approx. 400 words. Information in title should not be repeated. Use numbers where appropriate. Abstract must tell why & how you performed the study & what did you learn by the results of the study.

Introduction:

For writing a good introduction PGTs must know what the body of the paper says. Preferably the introductory section(s) should be written after PGTs have completed the rest of the paper, rather than before. Be sure to include a sufficiently interesting statement at the beginning of the introduction to motivate reader to read the rest of the paper. This is the scientific problem that PGTs paper either solves or addresses. PGTs should attract the reader in and make them want to read the rest of the thesis.

The next paragraphs in the introduction should quote previous research in this field. It should cite those who had the idea or ideas first, and should also cite those who have done the most recent and relevant work. PGT should then go on to explain why more work was necessary (PGT work, of course.)

PGTs should also state the goal of the paper: why the study was undertaken, or why the paper was written. Do not repeat the abstract. Provide sufficient background information to allow the reader to understand the context and significance of the question PGTs are trying to address. Mention proper acknowledgement of the previous work on which they building their thesis. Give sufficient references at the end. The introduction should be focused on the thesis question(s). All cited work should be directly relevant to the goals of the thesis.

Aims and objectives:

An objective is indication of what the researcher wants to study. It should be stated in clear measurable terms and should be itemized. The objectives and aims should be only a few (2-3). They must pertain to the study problem.

Material and methods:

It should be same as stated in the synopsis. It includes:

- study design:

Mention the name of the appropriate study design.

- setting:

Name and place where the research work is to be conducted

- duration of study:

How long will the study take?

- sample size:

How many patients will be included? If there are groups how many per group?

- sampling technique:

Type of sampling technique employed.

- sample selection:

Inclusion criteria: on what basis will patients be inducted in the study?

Exclusion criteria: on what basis will patients be excluded from the study?

- data collection procedure:

A detailed account of how the researcher will perform research; how she/he will measure the variable. It includes:

Identification of the study variables

Methods for collection of data

Data collection tools (proforma/questionnaire)

- data analysis procedure:

Data analysis is an important part of a research project. A good analysis leads to good results. Relevant details naming software to be used, which descriptive statistics and which test of significance if and when required, specifying variables where it will be applied. A general statement "appropriate statistical methods will be used." must be avoided.

Results:

The results are actual statements of observations, including statistics, tables and graphs. Results indicate information on range of variation. Mention negative results as well as positive. Do not interpret results, save that for the discussion. Use s.i. units (m, s, kg, w, etc.) Throughout the thesis. Break up their results into logical segments by using subheadings. Key results should be stated in clear sentences at the beginning of paragraphs. It is far better to say "x had significant positive relationship with y than to start with a less informative like "there is a significant relationship between x and y". Describe the nature of the findings; do not just tell the reader whether or not they are significant.

Tables & figures:

All tables must be numbered. A caption should be positioned at the top of the table. If the caption is written in a single line, it should be centered. If the caption is written more than one line, it should be aligned to the left. Tables must be numbered with respect to the chapter. Illustrations such as maps, charts, graphs, drawings, diagrams, and photographs are referred as figures. All figures must be clear and of high quality. Figures must be numbered. A caption should be located at the bottom of the figure. If the caption is written in a single line, it should be centered.

If the caption is written in more than one line, it should be aligning to the left. Figures are numbered with respect to the chapter.

Discussion:

Discussion should be started with a few sentences that summarize the most important results. The discussion section should be a brief essay in itself. It should emphasize on the major patterns in the observations, the relationships, trends and generalizations among the results. The exceptions to these patterns or generalizations should also be mentioned. Describe the likely causes (mechanisms) underlying these patterns resulting predictions. Explain the agreement or disagreement with previous work. Interpret results in terms of background laid out in the introduction. Mention the implications of the present results. Include the evidence or line of reasoning supporting each interpretation. This section should be rich in references to similar work and background needed to interpret results. However, interpretation/discussion section(s) are often too long and verbose. Break up the sections into logical segments by using subheads.

Conclusion:

Conclusions include the strongest and most important statement that PGT can make from his/her observations. Refer back to problem posed, and describe the conclusions that PGT reached from carrying out this investigation, summarize new observations, new interpretations, and new insights that have resulted from the present work. Include the broader implications of your results. Do not repeat word for word the abstract, introduction or discussion. The conclusions should be linked with the objectives of the study.

Appendices:

Appendices are supplementary materials to the text. These include tables, charts, computer program listings, and others.

References:

References are detailed description of items from which information were obtained in preparing the thesis. All references must be listed at the end of the text.

Policy for MD thesis writing and submission:

- student will select topic and get it approved in first year.
- student will write synopsis and get it approved in 2nd year.
- in the 3rd year student will do research work.
- in the 4th year student will complete research work and write down the thesis. The

thesis submitted by MD candidate shall comply with the following conditions:

(a) it shall form a distinct contribution to knowledge and afford evidence of originality, shown by the discovery of new facts, by the exercise of independent critical judgment, and/or by the invention of new methods of investigation.

(b) it shall not include research work for which a degree has already been conferred in this or any other university.

(c) it shall be written in English and the presentation must be satisfactory for publication.

(d) any part of the thesis which has been published before submission of the thesis may be appended at the end of the thesis.

Plagiarism undertaking

I solemnly declare that research work presented in the thesis titled
"…….

……."

Is solely my research work with no significant contribution from any other person. Small contribution/help wherever taken has been duly acknowledged and that complete thesis has been written by me.

I understand the zero tolerance policy of the HEC/PMDC/RMU

…… (name of university) ……

Towards plagiarism. Therefore i as an author of the above titled thesis declare that no portion of my thesis has been plagiarized and any material used as reference is properly referred/cited.

I undertake that if i am found guilty of any formal plagiarism in the above titled thesis even after award of MD degree, the university reserves the rights to withdraw/revoke m degree and that hec and the university has the right to publish my name on the hec/university website on which names of students are placed who submitted plagiarized thesis.

Student /author signature:_____name:_____

SECTION-VII

POSTGRADUATE TRAINEE EVALUATION

PGT EVULATION

360 Degree evaluation of PGTs by:

- Students
- Lab Staff
- Mentors
- Supervisors

EVALUATIONS

- To make sure that residents/students are evaluated fairly, the evaluators will attend workshops on evaluation methodologies.
- There will be structured viva and written assessments
- Keys will be provided to evaluators for checking written papers/viva
- For annual confidential written evaluations of the PGT by the students, Feedback proforma will be designed in which all aspects related to teaching like Knowledge, punctuality, tolerance level, professionalism, communication skills and behavior with student will be covered.
- To ensure confidentiality students will be asked to fill proforma without showing their identity, different students will be asked to fill proforma at different times
- All data will be computerized and a, pass code will be generated so only concerned person will be able to access these feedback proforma
- A confidential letter will be written to PGT in which details of his/her annual Feedback will be told including all positive and negative aspects
- He /she will be called in HOD office to discuss areas where improvement is required
- He/she will be encouraged to convert weaknesses into strengths by addressing his problems

DEPARTMENT OF ANATOMY

RAWALPINDI MEDICAL UNIVERSITY, RWP

PGT EVULATION PROFORMA BY SUPERVISOR

NAME: _____SESSION: _____

PROGRAMME:_____COURSE TITLE: _____

ATTENDANCE

PRESENTATIONS

LECTURES

SGD

TUTORIALs/GUIDED SELF-STUDY

PRACTICAL

PROFESSIONALISM

CONDUCT

TEST RESULTS

WRITTEN

VIVA

TOTAL

REMARKS

SUPERVISOR SIGNATURE :_____

PGT EVALUATION BY STUDENTS

Proforma

Teacher Evaluation Form

(To be filled by the student)

Course Title and Number: _____

Name of Instructor: _____Year _____

Department: _____Degree _____

Use the scale to answer the following questions below and make comments

A: Strongly Agree B: Agree C: Uncertain D: Disagree E: Strongly Disagree

Instructor:

1. The Instructor is prepared for each class A B C D E
2. The Instructor demonstrates knowledge of the subject A B C D E
3. The Instructor has completed the whole course A B C D E
4. The Instructor provides additional material apart from the textbook A B C D E
5. The Instructor gives citations regarding current situations with reference to Pakistani context. A B C D E
6. The Instructor communicates the subject matter effectively A B C D E
7. The Instructor shows respect towards students and encourages class participation A B C D E
8. The Instructor maintains an environment that is conducive to learning A B C D E
9. The Instructor arrives on time A B C D E
10. The Instructor leaves on time A B C D E
11. The Instructor is fair in examination A B C D E
12. The Instructor returns the graded scripts etc, in a reasonable amount of time A B C D E
13. The Instructor was available during the specified office hours and for after class consultations A B C D E

Course:

14. The subject matter presented in the course has increased your knowledge of the subject
A B C D E

15. The syllabus clearly states course objectives requirements, procedures and grading criteria
A B C D E

16. The course integrates theoretical course concepts with real-world applicationsA B C D
E

17. The assignments and exams covered the materials presented in the course A B C D E

18. The course material is modern and updated A B C D E

Comments:

Instructor:_____
_____
_____

Course:_____
_____
_____

Proforma-2

Faculty Course Review Report

(To be filled by each teacher at the time of Course Completion)

Part-I

Department: Faculty:

Course Code: Title:

Batch: Term: Year:

Credit / Contract

Weeks: No. of Lectures Conducted

No. of Students enrolled

Designation

Assessment Methods: Please give precise details (no & length of assignments, tests and presentations)

Comments:

_____

Overview/ Evaluation (Course Co-Coordinator's Comments)

Feedback: first summarize, and then comment on feedback received form:

1) Student (Course Evaluation) Questionnaires (filled by QEC)

2) External Examiners or Moderators (if any)

(comments of External examiner if any)

3) Curriculum: comment on the continuing appropriateness of the Course curriculum in relation to the intended learning outcomes (course objectives) and its compliance with the HEC Approved / Revised National Curriculum Guidelines (comments by the course teacher)

4) Assessment: comment on the continuing effectiveness of method(s) of assessment in relation to the intended learning outcomes (Course objectives)

(comments by the course teacher)

5) Enhancement: comment on the implementation of changes proposed in earlier Faculty Course Review Reports (comments by the course teacher)

6) Outline: any changes in the future delivery or structure of the Course that this year /term's experience may prompt (by the course teacher)

Name/ Signature _____ Date_____

(Course Instructor)

Name/ Signature _____ Date_____

(Head of Department)

SECTION-VIII

ASSESSMENT

ASSESSMENT

Formative assessment

Summative assessment

Assessment Procedure:

- Assignment 20 marks percent marks
- Test 30 marks percent marks
- Total / Number of all percent marks Weight age 30% (Internal assessment)
- End year Examination

a. MCQs 100 marks

b. SAQs 100 marks

c. Viva & OSPE 200 marks

Total 400 marks Weight age 70 %

- Thesis marks 100 Marks approved by three local examiners

3. Calculate GPA as per University rules.

Assignments:

- Trainees/students will be informed about their assignments/duties by putting their duty rosters and teaching schedules on notice boards on weekly basis
- By keeping academic log books
- By maintaining and displaying annual academic calendars
- All schedules will be readily available on college website

STANDARD OF PASSING

1. Cleared year exams: A comprehensive exam would be held on the minor subject related to the research topic at the end of 3rd year along with the year exam of course work.

2. The Thesis examined or to be examined by at three examiners: If the scholar has completed his/ her dissertation then the dissertation has to be examined by minimum of three examiners preferably from technologically advanced universities.

3. Has the Thesis been defended If yes, then provide the details including date of defense, whether it was an open defense, notification of the defense etc.

Defense Examination

a. There shall be a standing list of external examiners for respective department consisting of persons of eminence in the field of research. The list shall be suggested from time to time by the board of studies of faculty concerned and approved by the research board. The external examiners will be requested to critically examine the thesis for its suitability for the award of MD degree.

b. There shall also be a standing list of local examiners for department consisting of eminent persons engaged in research. The list shall be suggested from time to time by the board of studies of the department/board of faculty concerned and approved by the research board. The local examiners will be requested to conduct the final viva-voce examinations of thesis.

c. The candidate shall in the first instance submit six unbound copies of his/her completed thesis along with an application on prescribed form for the evaluation of his/her thesis, duly forwarded by his/her supervisor and the chairman of the department:-

Three for external

One for examination section

One for department office

One for the supervisor

i. After corrections have been incorporated in accordance with the comments of external examiners; two copies of thesis in loose binding, to be sent to viva-voce examiners.

ii. After the viva-voce examination; four copies of the final hard-bound thesis be submitted:-

i. One for examination section

ii. One for central library

iii. One for departmental office

iv. One for supervisor

c. The supervisor shall suggest a panel of at least six external examiners from the approved list. The vice-chancellor shall appoint three external examiners from the suggested panel to evaluate the thesis.

d. The reports of the examiners shall be placed before the research board for consideration.

e. If the thesis is adjudged as adequate by two of the three examiners, the research board shall allow the candidate to appear in the viva-voce (thesis defense) examination.

f. If two of the three examiners find that the thesis is wholly inadequate it may be rejected by the research board.

g. If any of the examiners suggests modification/revision of the thesis, the candidate shall be required to resubmit a revised version of the thesis, duly certified by the supervisor, within one year.

h.The revised version of the thesis shall be approved by the same examiner who suggested modification/revision of the thesis.

i. If any of the examiners finds the thesis adequate but suggests minor modifications/revision, this may be incorporated without referring again to the examiner as required in clause (i).

j. The viva-voce examination shall be conducted by the two external examiners appointed by the vice-chancellor from the panel approved by the research board, the supervisor and the chairman of the department concerned.

k.The viva-voce examination shall be open to the public but the evaluation will be done only by the panel of examiners.

l. If the candidate fails to satisfy the examiners in the viva-voce examination he/she may be given a chance to defend the thesis for the second and final time within a period of six months.

m. A candidate who successfully completes all the requirements shall be awarded, with the approval of the research board and the syndicate, the degree of MD under the seal of the university.

The vice-chancellor may approve the recommendations of the research board on behalf of the syndicate regarding the award of MD degree to the candidate.

RMU Grading System

It will be based on GPA – 4 system

Percentage range	**Numerical Grade**	**Alphabetical Grade**
80-100	4.0	A+
75-79	4.0	A
70-74	3.7	A-
67-69	3.3	B+
63-66	3.0	B
60-62	2.7	B-
56-59	2.3	C+
50-55	2.0	C
<50	Un-grade-able	0

A candidate obtaining GPA less than 2.00 (50%) is declared un-graded (fail). Cumulative transcript is issued at the end of clearance of each year .

SECTION- IX

PGT TOOLKIT FOR FORMATIVE ASSESSMENT

Maintenance of Record

PORTFOLIO

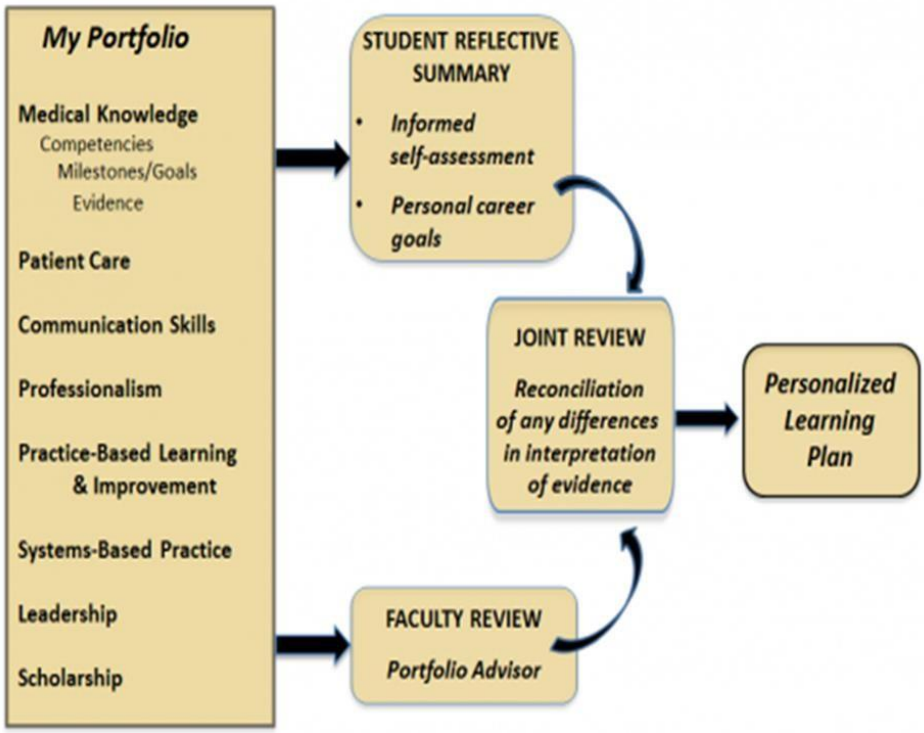
PGTs will maintain a portfolio that takes the portfolio resume concept one step further in a multiple-page document that thoroughly covers PGTs career to date.

Portfolio will contain:

- Table of contents
- Copy of standard resume
- Education: degrees, certifications, etc.
- Skills and achievements
- Career goals
- Mission statement or guiding principles
- Professional summary
- Personnel Essay
- Previous Work samples
- Evaluations or recommendations
- Publications and research
- Volunteer work
- Awards and acknowledgements
- List of references
- Cover Letter
- Critical Choices
- Senior Memory Book
- Two-Year Plan
- Academic Work samples
- Projects, examples, posters
- Student reflections (either weekly, monthly, or bi-monthly)
- Pivotal Points

- Charts, graphs created
- CPC attendance
- Assignments

PGTs will organize portfolio into sections. Use page numbers and a table of contents to make the information easy to find, as well as tabs or dividers between sections.



Example – Reflective Log

1. Describe a learning/teaching experience that was significant for PGTs.

2. Reflect on why this experience was significant for PGTs. How did PGTs feel/react? What were they thinking then?

3. Think about what this experience means. What do PGTs think made them feel/think/react in this way?

4. What do you think you learnt from this experience?

5. What would PGTs do differently in the future if PGTs found yourself in a similar situation?

Example –Learning Activity Diary

Date:

Learning Activity:

Participants involved (students/teachers/tutors etc):

What did you understand to be the purpose of the learning activity?

At the start of the activity, what did you think you were required to do to successfully complete it?

What learning resources did you use to help you? (e.g. books, equipment, internet resources the advice and help of others including fellow students)

What did you learn?

Did you find the learning activity straightforward or difficult? Why?

If you were asked to do the activity again, what would you do differently?

Making Plans to Achieve your Goals

PGTs will use this template to break down your goals, whether they're academic, career-orientated or personal, into specific and achievable steps. Set target dates for short-, medium- and long-term goals to keep yourself motivated, but don't worry if you have to adjust these dates as you progress.

Goal:

How will I benefit from reaching this goal?

What obstacles and difficulties might I face?

Whom can I approach to help me reach my goal?

What resources might I need?

What incremental steps do I need to take to achieve my goal?

Action Needed	Date to Complete	Completed
☐		
☐		
☐		
☐		
☐		

What lessons have you learnt from this process that might be useful next time?

FORMATIVE ASSESSMENT / Progress Review

PGTs will use this form to reflect on progress since last meeting with their personal mentor.

This is an opportunity to think about how they performed in different units over the last teaching block: not just what marks received, but how well they got to grips with the subject matter and the skills involved and what lessons drawn from the experience for work in future.

They will take the form to mentor, in advance as a basis for the discussion.

(1) How would you sum up your experiences over the last teaching block?

(2) What have been the main strengths in your performance?

(3) What are the main skills which you have acquired or developed?

(4) What have been the most important points raised in the feedback you have received?

(5) What are the main areas where you feel you can improve your performance?

(6) Are there any skills that you need to develop to do this?

(7) What are your key aims for your work over the next teaching block?

(8) Is there anything that you feel is holding you back in achieving these aims?