



Institute of Dentistry,
CMH Lahore Medical College
Curriculum and Study Guide-
2022
Department of Pathology
Second Year BDS
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Introduction to study guide

This study guide book is designed for Dental undergraduates by consolidated effort of all subjects across the year to provide Dental students of IOD CMH Lahore Medical College a resource material which would highlight important aspects of curriculum. The study guide aims to promote self-regulated lifelong learning among students by giving them the control over their learning.

The pervasive curriculum aspects of undergraduates' competencies, assessment policies and curriculum coordinators are mapped in this guide book. Horizontal integration across the year better conceptual understanding while vertical integration promotes clinically relevant understanding. IOD CMH aims to improve health indicators of society by improvement of students and doctors in preventive health service provision and health education provision to society through community programs.

The study guide gives an overview of intended course outcomes and objectives in relation to the course content. The assessment methodology tailored to intuitional strategy is provided.

This study guide has been carefully designed keeping in view PMC and NUMS curriculum and giving dedicated effort by faculty is done to make this guide tailored to student's needs. Students feedback has been seeded and incorporated at all stages during study guide development. Curriculum is a living dynamic entity. Our aim to improve it by every passing day. This humble effort of all faculty acts as a guiding light for our dear students.

Mission Statement

To provide an excellent learning and teaching environment, inculcating ethical values and social responsibilities in undergraduate and postgraduate medical & dental students and nursing and allied health sciences students to enhance the level of comprehension healthcare in the Army/Country

Rationale of Curriculum

The curriculum is designed to address both local and international needs. The curriculum is focused to prepare students for the international licencing exams and training abroad as well as empowering them to treat local patients with safety and efficiency. Dentists work as a healer in the community. A dentist should have evidence based and update knowledge about the epidemiology of the practicing area. The curriculum of IOD CMH LMC is planned with a collaboration of clinical and basic sciences faculty in addition to students and family medicine department to ensure that the prevailing health conditions of the society are treated and dealt with effectively. The emergence of new techniques in preservation of existing dentition and restoration of the lost dentition and oral structures has led to changes in the curriculum with more emphasis on new and advanced techniques, procedures and evolution of new and advanced technology (e.g. CAD/CAM & Implants).

Introduction to Curricular Framework

This study guide is developed as resource assistance to the students and faculty. The study guide development process included representation from teaching faculty, management, leadership of college and students. The study guide is made to achieve and alignment between societies' needs, institutional needs, patient needs & student's needs.

The curriculum implemented is a hybrid type of curriculum which has both horizontal and vertical integration. Spiral integration is introduced as an adjunct to horizontal and vertical integration. The curriculum spans over 3 phases

PHASE 1 (Year 1&2): Includes basic sciences Anatomy, physiology, biochemistry, Oral biology, Science of dental Material, Pharmacology and Community Dentistry, it also includes preclinical Prosthodontics, general pathology.

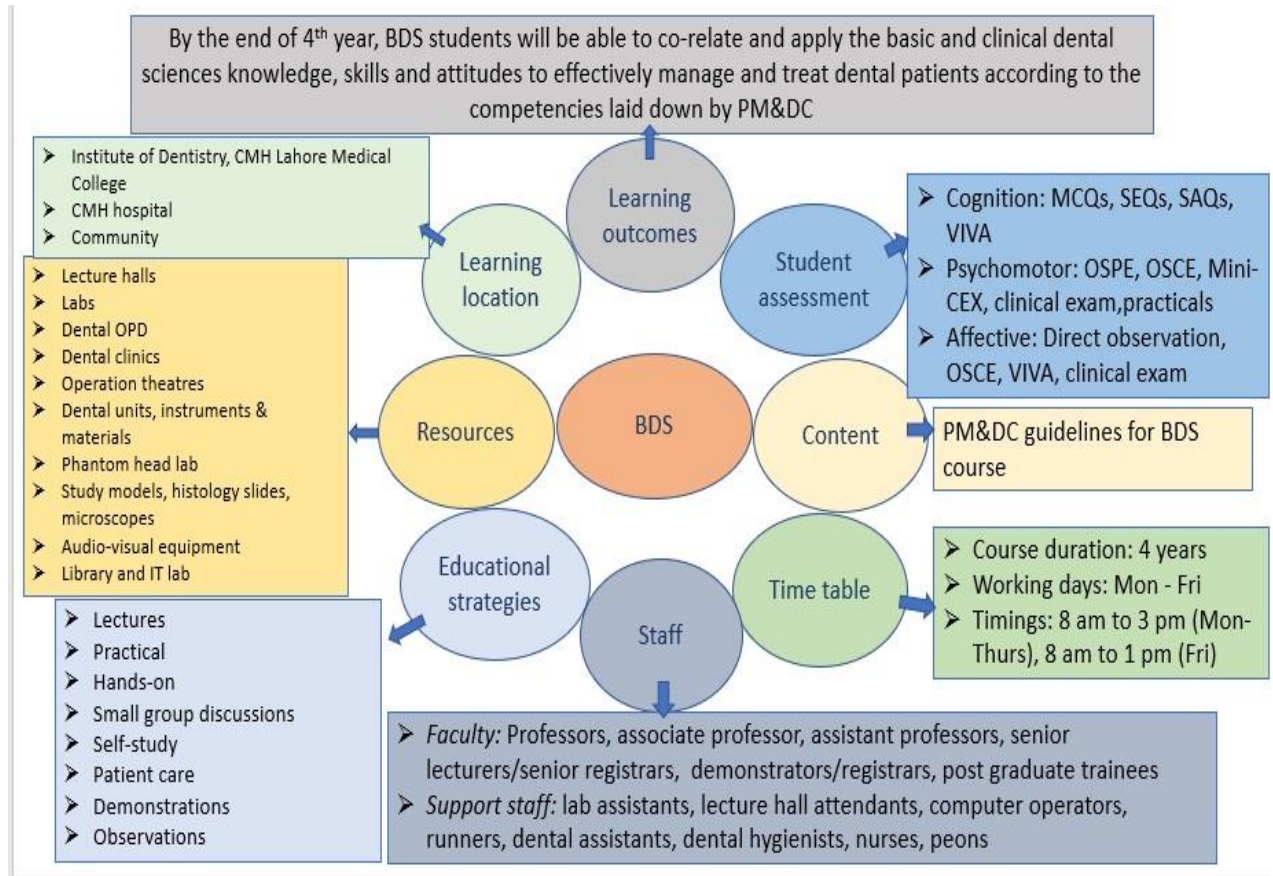
PHASE 2 (Year 3rd & Final Year): includes Periodontology, Oral Pathology, Oral Medicine, General Medicine, General Surgery, Oral Surgery, Prosthodontics, Orthodontics, Operative Dentistry.

4 Years Curricular Framework

BDS SCHEME OF STUDIES

<u>BASIC DENTAL SCIENCES / PRE-CLINICAL YEAR</u>		<u>CLINICAL YEARS</u>	
1 st YEAR	2 nd Year	3 rd Year	Final Year
Anatomy	Science of Dental Material	Periodontology	Prosthodontics
Physiology	Gen. Pathology	Oral pathology	Operative Dentistry
Biochemistry	Pharmacology	Oral Medicine	Oral Surgery
Pak studies & Islamic Studies	Behavioral Sciences	Gen. Medicine	Orthodontics
Oral Biology	Community Dentistry	Gen. Surgery	
	Pre-Prosthodontics	Oral Surgery	
	Pre-Operative Dentistry	Prosthodontics	
Self-Directed Learning Sessions			

BDS curricular map



Undergraduate Competencies

IOD CMH Lahore medical College envisions to produce graduates who are proficient in following competencies at the end of 4th year

- ◆ Dental Expertise
- ◆ Communication
- ◆ Critical thinking
- ◆ Management
- ◆ Scholar
- ◆ Professionalism
- ◆ Evidence based practice providing holistic care
- ◆ Empathetic
- ◆ Providing Community service

Co-ordinators Second Year BDS 2022

Coordinator Name	Department	Extension no.
Prof. Dr. Sahabat Javaid Butt	General Pathology and Microbiology	345
Dr. Fatima Hmaeed	General Pathology and Microbiology	487
Dr. Unzilla Abbas	General Pathology and Microbiology	
Dr. Hira Akbar	General Pathology and Microbiology	
Dr. Minahil Nawaz Ranjha	General Pathology and Microbiology	

Class Representatives

Name	Designation
-	CR 1st Year BDS
-	GR 1st Year BDS
Amun	CR 2nd Year BDS
Momina	GR 2nd Year BDS
Ali Nadeem	CR 3rd Year BDS
Maryam Iqbal	GR 3rd Year BDS
Saad Khakwani	CR Final Year BDS
Hafiza Eman	GR Final Year BDS

Clerkship Subjects

Following are the core subjects for second year BDS for which professional examination will be held at the end of the academic year:

1. General Pathology and Microbiology
2. Science of Dental Materials
3. Pharmacology
4. Behavioural Sciences
5. Community Dentistry
6. Pre-Prosthodontics
7. Pre-Operative Dentistry

Hours of teaching

Subject	Total Teaching Hours CMH
General Pathology and Microbiology	250
Science of dental materials	
Pharmacology	
Behavioural sciences	
Community dentistry	
Pre-prosthodontics	
Pre-operative dentistry	

INTRODUCTION TO GENERAL PATHOLOGY AND **MICROBIOLOGY**

The subject of General Pathology and Microbiology at an undergraduate level enables the students to recognize the / structural and functional causes of human disease. The four aspects of a disease process that form the core of pathology are: the cause of a disease (etiology), the mechanism(s) of disease development (pathogenesis), the structural alterations induced in cells and tissues by the disease (morphologic change) and the functional consequences of the morphologic changes (clinical significance).

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Resources

1. Teaching resources
2. Infrastructure resources

Teaching resources

Sr. #.	Faculty Name	Department as per PM & DC certificate	Qualification
1	Prof. Dr. Sabahat Javaid Butt	Professor	MBBS, M Phil, DCP
3	Dr. Fatima Hameed	Assistant Professor	MBBS,FCPS
4	Dr. Unzilla Abbas	Demonstrator	BDS
5	Dr. Hira Akbar	Demonstrator	BDS
6	Dr. Minahil Nawaz Ranjha	Demonstrator	BDS

Infrastructure resources

Sr. #.	Infrastructure Resources	Quantity
1	Lecture hall <ul style="list-style-type: none">• Seating Capacity• Multimedia• Microphone• Computer system	• 1
2	General Pathology and Microbiology lab <ul style="list-style-type: none">• Microscope• Histological slides	• 1
3	Mini library	

TEACHING AND LEARNING STRATEGIES

Multiple educational methods will be used comprising of self-study, interactive lectures, group discussions and practicals.

(i) Methods for achieving cognitive objectives

- Interactive lectures using audio visual aids on power point presentation
- Group discussions in form of large group and small group
- Practical demonstrations
- Tutorials
- Collaborative learning
- Self-study and reading from learning resource

(ii) Methods for achieving psychomotor objectives

- Focusing the histological slides on microscope
- Identification of normal histological structures on slides under different magnification
- Drawing and labeling the histological slides on practical note books

(iii) Methods for achieving affective objectives

- Interaction with peers, group members, teachers, support staff etc.
- Group discussions (small and large)
- Oral presentations by students

LEARNING METHODOLOGIES

The following teaching / learning methods are used to promote better understanding:

- Interactive Lectures
- Hospital / Clinic visits
- Small Group Discussion

- Case- Based Learning
- E- Learning
- Self- Directed Study

INTERACTIVE LECTURES

In large group, the lecturer introduces a topic or common clinical conditions and explains the underlying phenomena through questions, pictures, videos of patients, interviews, exercise etc. students are actively involved in the learning process.

HOSPITAL VISITS:

In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical science of the relevant module.

SMALL GROUP DISCUSSION (SGD)

This format helps students to clarify concepts acquire skills or attitudes. Sessions are structured with the help of specific exercise such as patient case, interviews or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

CASE- BASED LEARNING

A small group discussion format where learning is focused around a series of questions based on a clinical scenario. Students' discuss and answer the questions applying relevant knowledge gained in clinical and basic health sciences during the module.

SELF DIRECTED STUDY

Students' assume responsibilities of their own learning through individual study, sharing and discussing with peer, seeking information from Learning Resource center, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self- study.

E- LEARNING

E-Learning is a strategy by which learning occurs through the utilization of electronic media, typically the Internet. The basic aspects of medical professionalism and ethics will be addressed through and E-Learning course.

CURRICULUM IMPLEMENTATION

Curriculum implementation refers to putting into practice the official document including course content, objectives, learning and teaching strategies. Implementation process helps the learner to achieve knowledge, skills and attitudes required of the learning tasks. Learners are a pertinent component of the implementation process. Implementation occurs when the learner achieves the intended learning experiences, knowledge, ideas, skills and attitudes which are aimed to make the learner an effective part of the society. Curriculum implementation also refers to the stage at which curriculum is put into effect. There has to be an implementing agent as well. Teacher is an important part of this process and implementation of the curriculum is the way the teacher selects and utilizes various components of the curriculum. Implementation occurs when the teacher's formulated course content, teacher's personality and teaching and learning environment interact with the learners. Therefore, curriculum implementation is how the officially planned course of study is translated and reflected by the teacher into schemes of work, lesson plans, syllabus and resources are effectively transferred to the learners. Curriculum implementation can be affected by certain factors such as teachers, learners, learning environment, resource materials and facilities, culture and ideology, instructional supervision and assessments.

Personnel involved in teaching and facilitation

(i) Lectures delivery by: Prof. Dr. Sabahat Javaid (Professor)
Dr. Fatima Hameed (Assistant professor)

(iv) Demonstrators for clinics/practical and small group discussion sessions:
Dr. Unzilla Abbas (BDS)
Dr. Hira Akbar (BDS)
Dr. Minahil Nawaz Ranjha (BDS)

(iii) Support staff: 1 as nominated by the medical education department

(iv) Lab Technician : 1 as nominated by the college

(v) Computer assistant: 1 as nominated by the college

Time frame

Course duration: 39 weeks

Lectures: Monday: (8:00 to 8:50am)

Tuesday: (8:50 to 9:40 am), (2:00 to 3:00 pm)

Thursday: (11:50 to 12:40 pm)

Practical/ clinical visits: Tuesday (11:45 to 2:00 pm)

Wednesday (12:40 to 3:00 pm)

Self-study: 5-6 hours per week

Course outline

Section I Cell injury and adaptation to cell injury

This section introduces students to the balance between physiologic demands and the constraints of cell structure and metabolic capacity; the result is a steady state, or homeostasis. Cells can alter their functional state in response to modest stress to maintain the steady state. More excessive physiologic stresses, or adverse pathologic stimuli (injury), result in (1) adaption, (2) reversible injury, or (3) irreversible injury and cell death. These responses may be considered a continuum of progressive impairment of cell structure and function.

SECTION II Acute and Chronic Inflammation

This section familiarizes students with inflammation that is the response of vascularized living tissue to injury. It may be evoked by microbial infections, physical agents, chemicals, necrotic tissue, or immune reactions. Inflammation is intended to contain and isolate injury, to destroy invading microorganisms and inactivate toxins, and to prepare the tissue for healing and repair.

SECTION III Tissue Renewal, Regeneration and Repair

The section covers detailed information regarding the cell and tissue injury that sets into motion events that will eliminate the offending agent, contain the damage, and prepare surviving cells for replication. The healing process is broadly separated into regeneration and repair.

SECTION IV Hemodynamic disorders, Thromboembolic disease and Shock

The section provides information regarding disturbances in normal blood flow that are major sources of human morbidity and death. These include hemorrhage, clotting, and embolization (migration of clots to other sites), as well as extravasation of fluid into the interstitium (edema) and blood pressure that is either too low or too high

SECTION V Genetic Disorders

The section deals with the introduction and knowledge of several types of genetic abnormalities that affect the structure and function of proteins, disrupting cellular homeostasis and contributing to disease.

SECTION VI Diseases Of The Immune System

The section focuses on the immune system and the students should be able to recognize various immune cells, their functions and production of the cell lines. They should know about the various hypersensitivity reactions, their clinical signs and symptoms and the mediators of inflammation. They are taught about autoimmune disorders, complement system, mediators of complement and biological effects of the complement system.

SECTION VI Neoplasia

This section covers classification of a tumor as either benign or malignant ultimately depending on its clinical behavior; however, morphologic evaluation (and, increasingly, molecular profiling) allows categorization based on degree of differentiation, growth rate, local invasion, and metastasis.

SECTION VII Microbiology

1) Bacteriology:

This section includes basic and clinical aspects of various bacteria included in their course outline. It includes the etiology, signs and symptoms, lab diagnosis, culture media and their treatment.

2) Virology :

This section covers the classifications of all viruses included in their syllabus, important viruses that can cause various oral and systemic infections e.g. HPV, HIV etc. It also includes the structure and transmission of these viruses and also signs and symptoms of disease and their important lab diagnostic tests leading to treatment planning.

3) Parasitology :

This section includes various parasites included in their course outline. It includes the etiology, habitat, signs and symptoms, lifecycles of the organisms and their treatment.

4) Mycology:

This section includes various fungi included in their course outline. It includes the etiology, habitat, signs and symptoms and their treatment.

Table of specification for teaching, learning objectives and assessment

At the end of the year students will be able to know:

Topics & Objectives	Learning Domain (CPA)	Faculty	Learning methods
I. Cell Injury and Cellular Adaptations			
<ul style="list-style-type: none"> • Introduction Causes of cell injury • Ischemic and hypoxic injury • Free radicals and cell injury • Cell death (necrosis) types of necrosis; pathogenesis and clinical examples of each • Gangrene dry, wet and gas gangrene with clinical examples Intracellular accumulations • Fatty change – pathogenesis and manifestations of fatty change in liver and kidneys • Pigments endogenous and exogenous; disorders of pigmentation with special emphasis on oral pigmentation • Cellular adaptations of growth and differentiation; hypertrophy, hyperplasia, atrophy, hypoplasia, metaplasia and dysplasia • Calcification – metastatic and dystrophic Hyaline change • Brief interpretation of Liver function tests and Lipid profile • Brief overview of metabolic disorders: Lipid 	C	Prof. Dr. Sabahat Javaid	Lectures/Small group discussions/Tutorials

<p>disorders, steatosis of liver, hyperlipidemia; Protein disorders; Carbohydrate disorders</p> <ul style="list-style-type: none"> Diabetes mellitus; Normal blood glucose levels and diagnostic tests Of Diabetes mellitus (HbA1C and Glucose tolerance test) 			
II. <u>Inflammation</u>			
<p>Introduction</p> <ul style="list-style-type: none"> Acute inflammation cellular and vascular events Mononuclear phagocytes system Chronic inflammation Chronic granulomatous inflammation Giant cells Morphologic patterns in acute and chronic inflammation Systemic effects of inflammation <p>Brief interpretation of CBC and ESR</p>	C	Prof. Dr. Sabahat Javaid	Lecture/Small group discussions/Tutorials
III- Healing and Repair			
<p>Introduction Regeneration</p> <p>Repair by connective tissue Healing of skin wounds Complications of wound healing Mechanisms involved in Repair</p> <p>Factors affecting healing – local as well as systemic Healing in specialized tissues (Bone)</p> <p>Abnormalities of fracture healing</p>	C	Prof. Dr. Sabahat Javaid	Lectures/Small group discussions/Tutorials
IV – Hemodynamics			
<p>Hyperemia and congestion Edema</p> <p>Shock – types with pathogenesis and stages Burns</p>	C	Prof. Dr. Sabahat Javaid	

<p>Thrombosis Embolism Infarction</p> <p>Pathological laboratory diagnosis of Myocardial infarction</p> <p>Brief interpretation of bleeding and clotting time (PT, aPTT, INR)</p>			<p>Lectures/Sm all group discussions/T ut orials</p>
V- Immunology			
<p>Introduction Antigens</p> <p>The cellular basis of immune reaction Antibodies</p> <p>Complement system Cytokines</p> <p>The immune response</p> <p>Transplantation and major histocompatibility antigen</p> <p>Immune deficiency – congenital and acquired clinical significance of common immunodeficiencies</p> <p>Hypersensitivity reactions; pathogenesis and clinical examples Autoimmunity; pathogenesis and clinical examples Amyloidosis; classification, pathogenesis and clinical examples Vaccination</p> <p>Blood groups</p>	C	<p>Prof. Sabahat J Butt</p>	<p>Lectures/Sm all group discussions/T ut orials</p>
VI- Genetic Basis of Disease			
<p>Introduction Mutations Mendelian disorders</p> <p>Disorders of defects in enzymes (Gout, Phenylketonuria, Galactosemia, Lysosomal storage diseases, Glycogen storage diseases)</p> <p>Cytogenetic disorders molecular diagnosis Diagnosis of genetic diseases (Brief overview)</p>	C	<p>Prof. Dr. Sabahat Javaid</p>	<p>Lectures/Sm all group discussions/T ut orials</p>
VII. Neoplasia			

<p>Introduction Classification of tumors Nomenclature of Tumors</p> <p>Characteristics of benign and malignant tumors with emphasis on local invasion, anaplasia and metastasis</p> <p>Differences between benign and malignant tumors Differences between carcinomas and sarcomas Biology of tumor growth</p> <p>Carcinogenic agents and their cellular interactions Chemical carcinogenesis</p> <p>Radiation carcinogenesis Viral oncogenesis Oncogenes and cancer Pathogenesis of cancer</p> <p>Effect of malignant tumors on host Oral cancer and precancerous lesions Laboratory diagnosis of cancer</p> <p>Submission of histopathological specimen</p>	C	Prof. Dr. Sabahat Javaid	Lectures/Small group discussions/Tutorials
VIII- Microbiology			
<p>Bacteriology: Common bacteria and their pathogenicity: cocci, bacilli, spirochetes: Staphylococcus aureus, Streptococcus pneumonia, Beta hemolytic Streptococcus Group A & B, Diphtheria species, Bordetella species, Bacillus anthracis, Clostridium perfringes, Clostridium botulinum, Clostridium difficile, Clostridium tetani,</p> <p>Actinomyces israelii, Nocardia asteroides, Neisseria meningitidis, Neisseria gonorrhoea, Gardnerella vaginalis,</p> <p>Hemophilus influenzae, Mycobacterium tuberculosis, Mycobacterium leprae, E.Coli, Klebsiella, Proteus, Salmonella, Shigella, Yersinia pestis, Pseudomonas, Vibrio cholerae, Vibrio parahaemolyticus, Campylobacter jejuni, Helicobacter pylori, Legionella, Mycoplasma pneumoniae, Chlamydia, Treponema pallidum, Leptospira, Rickettsia</p>	C	Dr. Fatima Hameed	Lectures/Small group discussions/Tutorials

<p>Virology: Structure and properties of viruses and an overview of common viral infections: Mumps, Herpes, Measles, Influenza, Parainfluenza, Respiratory syncytial virus, Hepatitis A, B, C, D, E, Rota, Cytomegalovirus, Epstein bar virus, Rubella, Chicken pox, Human immunodeficiency virus, Rabies, Dengue virus, Congo virus</p> <p>Mycology: Structure and properties of fungi and an overview of common fungal infections: Cryptococcus neoformans, Candida albicans, Histoplasma, Coccidioides, Aspergillus, Mucor and Rhizopus, Dermatophytes</p> <p>Structure and properties of protozoa and an overview of common protozoal infections: Plasmodium species, Giardia lamblia, Entamoeba histolytica, Cryptosporidium, Leishmania species, Trichomonas vaginalis, Toxoplasma gondii, Pneumocystis carinii, Trypanosoma</p>	C	<p>Dr. Fatima Hameed</p> <p>Dr. Fatima Hameed</p>	Lectures/Small group discussions/Tutorials
<p>Parasitology: Structure and properties of parasites and an overview of common parasitic infections: Ascaris lumbricoides, Ancylostoma duodenale, Trichinella, Trichuris trichiura, Enterobius vermicularis, Filariasis species (Wuchereria bancrofti), Strongyloides, Schistosoma species, Echinococcus species, Taenia solium, Taenia saginata, Diphylobothrium latum, Hymenolepis nana, Onchocerca, Loa loa</p>	C	Dr. Fatima Hameed	Lectures/Small group discussions/Tutorials

Learning resources

General Pathology- Recommended book	Pathological basis of disease Cortan, Kumar, Collins (Robbins) Text book of Pathology by Waiter and Israel.
Microbiology and Parasitology - main textbook	Review of Medical Microbiology and Immunology by Warren Levinson, Essentials and Applications of Microbiology, Larry Mckane Judy Kandel Microbiology by Jawetz

OTHER LEARNING RESOURCES

Laboratory Demonstrations/ Hands-on activity	The laboratory demonstrations familiarize students with the clinical application of pathology in dentistry. It provides diseases and conditions by appearance and presentation, so that they can easily identify and plan treatment for problems.
Self Learning	Self-learning enables the student drive their own learning process. Students are directed to search the information from different resources in order to prepare for small group discussions and tutorials.

Summative assessment methods and policies:

Internal Assessment

- a. Weightage of internal assessment shall be 20 %, each for theory and practical, in BDS Professional Examination.
- b. The Internal Assessment shall comprise of monthly test / PBL / assignments / Clinical tests / clinical vivas
- c. etc
- d. The Internal Assessment record shall be kept in the respective department of the College / Institute and after approval of Principal, a summary as per University registration number shall be furnished to the Controller of Examinations, at least two weeks before the commencement of final examination.
- e. The result of all the class tests / tools which contribute towards IA will be displayed to the students during an academic year.
- f. The same internal assessment shall be counted both for annual and supplementary examinations. The students who are relegated, however, can improve the internal assessment during subsequent year
- g. Internal assessment tools of any subject may be changed after the approval of respective FBS

Annual Examination

- a. The weightage of Annual Examination shall be 80%, each for theory and practical, in BDS.
- b. The examination comprises of a theory paper and practical/clinical examinations as per PMC regulations and the Table of Specifications (TOS) of the University.
- c. The gap between two consecutive theory papers shall not be more than two days.
- d. The Theory Paper shall be of 3 hours duration, held under the arrangements of the university. It shall have two parts; MCQs (50%) and SAQs/SEQs (50 %) for the year 2021. It may be changed after the approval of Academic Council.
- e. Allocated time for MCQs and SEQs for 2021 shall be as under:

40 MCQs	-	1 hour
10 SEQs	-	2 hours
- f. Each MCQs shall have three distractors and one correct option.

Internal Examiner

He/she shall be Professor and Head of Department who has been involved in teaching of the class being examined for at least six months and has delivered 50% of the total lectures. Second preference shall be Associate/Assistant Professor who is involved in teaching of the class and posted there for one year. Third preference shall be a recognized Professor of the subject.

External Examiner

He/she shall be a Professor/Associate Professor of a recognized Medical/Dental College or at least an Assistant Professor with three years teaching experience in the relevant subject.

Conflict of Interest

No person shall serve as an examiner whose close relative (wife, husband, son, daughter, adopted son, adopted daughter, grand-son, grand-daughter, brother, sister, niece /nephew, son and daughter- in-law brother and sister- in-law, parental and maternal uncle and aunt etc) is appearing in the examination. All examiners likely to serve as an examiner shall render a certificate in compliance to this para.

Paper Setting

- a. Each College / Institute shall forward a set of two question papers as per TOS along with the key for each subject to the Controller of Examinations, at least three months in advance of the annual examination. The question paper as a whole / a question without a comprehensive key shall not be considered towards final paper setting.
- b. The set of question papers shall be prepared by the respective Head of Department (HoD) and furnished to Controller of Examinations through Head of Institution (HoI)
- c. The Controller of Examinations shall approve the faculty for the final paper setting having fair representation of each college / institute.

Paper Assessment

- a. The Controller of Examinations shall approve the faculty for the theory paper marking, to be undertaken in the manner as deemed appropriate.
- b. The Examination Directorate shall coordinate directly with the faculty, earmarked for the paper marking
- c. A student who scores 85% and above marks in any subject shall qualify for distinction in that particular subject.
- d. A fraction in aggregate marks of a subject shall be rounded off to whole number. If it is less than 0.5 then it will be rounded off to the previous whole number while 0.5 or more will be rounded off to the next whole number.

Practical / Clinical Examinations

- a. The Controller of Examiners shall approve the faculty to serve as the internal & external examiners.
- b. The number of external and internal examiners shall be equal.
- c. One external & internal examiner each shall be marked for a group of 100 students.
- d. Candidates may be divided into groups in the clinical and practical examinations and be standardized by incorporating clinical exam
- e. Practical/clinical examination shall be held after the theory examination of the subject but in special cases, it may be held before the theory examination with the approval of the Controller of Examinations. For the purpose of practical/clinical examination, the candidates may be divided into sub groups by the examiners.
- f. The assessment of the practical / clinical examination duly signed by internal & external examiner shall be furnished to the Controller of Examinations within one week of the conclusion of examination

Pass Markss

- a. Pass marks for all subjects less Islamic / Pakistan Studies, shall be 50 % in theory and practical, separately.
- b. Pass marks for Islamic / Pakistan Studies shall be 33 % which, however shall not be counted towards final scoring of the professional examination.
- c. No grace marks shall be allowed to any student in any examination.

Declaration of Result.

Every effort shall be made to declare the result of each examination within one month of the last practical examination or earlier.

Promotion.

No student shall be promoted to the higher classes unless he/she passes all the subjects of the previous specified fee.

Supplementary Examination.

The interval between a supplementary examination and the previous professional examination shall not be more than two months. There shall be no special supplementary examination.

Table of specification FOR annual examination General Pathology & Microbiology

Table of specifications for Annual Professional Examination: Theory

Marks of Written Paper = 80

Total Time Allowed = 03 hrs

10 x SAQs/SEQs = 4 marks each

01 x SAQs/SEQs = 1 marks each

(40 Marks) (1 Hour for SAQ's and 2 Hours for theory))

S.	Topi	No. of MCQs (40)	No. of SAQs/SEQs
		(Recall. 35; Application.5) 01 mark each	10 x SAQs/SEQs = 04 marks each 01 x SAQs/SEQs = 09 marks each)
1	Gen Microbiology	03	01
2	Parasitology	04	01
3	Special Microbiology	08	02
4	Parasitology – II & Mycology, Virology	02 + 03	01
5	Immunology & Genetics	02 + 02	01
6	Cell Injury & adaption to cell injury	03	01
7	Inflammation healing and repair	03	01
8	Hemodynamics	03	01
9	Neoplasia & environmental diseases/ Tobacco & alcohol abuse	03	01
10	Hematology & Environmental diseases	04	-
Total		40 (40Marks)	10 (40 Marks)

**Table of Specification for Practical &
Viva Voce Pre Annual , Annual and
Supplementary Examination Max Marks =100
Pass Marks = 50**

Roll No		Gen Viva voce 40 marks		Practical 40 marks				Total Viva+Prac	Int Assess 20	Grand Total
College	University	Ext.	Int.	Journal	Gen Path	Spotting	Observed	80	20	100
		20	20	05	15	10	10			

. Internal Assessment Calculation (Theory)

Roll No.	Name	All Modules/ Pre annual Exams or any other exam	Total Marks of internal Assessment out of 20
Total Marks		Sum of Marks obtained x 20 / sum of total marks in all exams	

A . Internal Assessment Calculation (Practical)

A	B	C	D
Roll No.	Name	OSPE/ PTT/ Class tests though out the year/ Pre annual Exams or any other exam	Total Marks of internal assessment Out of 20
Total Marks		Sum of Marks obtained x 20 / sum of total marks in all exams	

Sample MCQs and SEQs

Multiple Choice Question (MCQs)

- A multiple choice question (MCQ) consist of a stem that states the question or problem followed by a set of possible answers that contain an option that is best answer to the question.
- After reading the questions students should select the appropriate option from the given possible answers.
- The correct answer carries one mark and incorrect carries zero. There is no negative marking.

Sample MCQ

After initiation of an acute inflammatory process third in a sequence of changes in vascular flow is:

- Vasoconstriction.
- Redness.
- Leukocytic migration.
- Vasodilation.

Key: d

Short essay question (SEQs)

- Short essay questions require students to present written answers that are used to assess basic knowledge of key facts and provide students with an opportunity to demonstrate reasoning and explain their understanding of the subject.

Sample SEQ

- 1) A) Define chronic inflammation. Give two character types of chronic inflammation.
B) Give three causes of chronic inflammation.

Key:

- 1) **A) Define chronic inflammation. Give two character types of chronic inflammation.**
B) Give three causes of chronic inflammation.

Key:

a) Chronic inflammation refers to a prolonged inflammatory response that involves a progressive change in the type of cells present at the site of inflammation. It is characterized by the simultaneous destruction and repair of the tissue from the inflammatory process. It can follow an acute form of inflammation or be a prolonged low-grade form.

b) Several things can cause chronic inflammation, including:

- 1) untreated causes of acute inflammation, such as an infection or injury
- 2) an autoimmune disorder, which involves your immune system mistakenly attacking healthy tissue
- 3) long-term exposure to irritants, such as industrial chemicals or polluted air.

b) Several things can cause chronic inflammation, including:

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Curricular map of General Pathology and Microbiology

