



**Institute of Dentistry,
CMH Lahore Medical College
Curriculum & Study Guide
First Year BDS**

deaniod@cmhlahore.edu.pk

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 instructional strategy is provided.

This study guide has been carefully designed keeping in view PMDC and NUMS curriculum and guide lining dedicated effort by faculty is done to make this guide tailored to student's needs. Students feedback has been sought 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.

VISION STATEMENT

To ensure the development of internationally acclaimed quality standards and practices for NUMS Higher Education that benefits and lives up to the stakeholder's needs and expectations.

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 comprehensive 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 & Tooth Morphology, Sciences of Dental Materials, Pharmacology and Community Dentistry, General Pathology, Islamiyat and Pakistan Studies. It also includes preclinical Prosthodontics and Operative Dentistry.

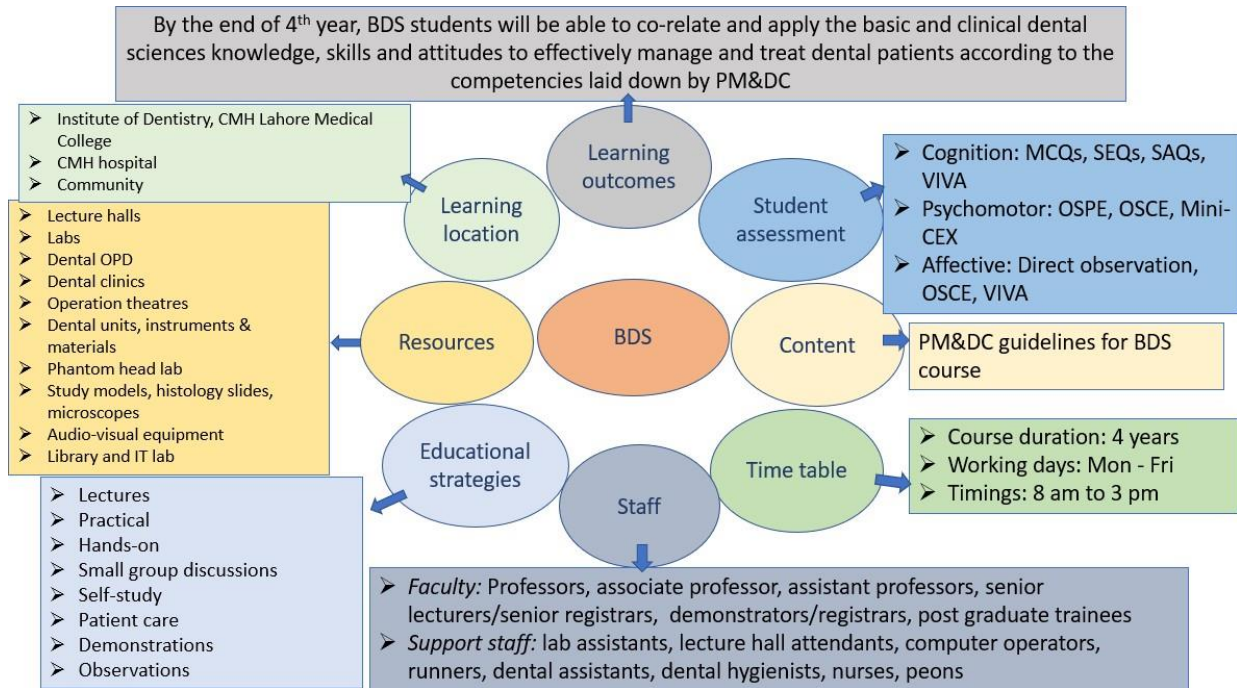
PHASE 2 (Year 3rd & Final Year): includes Periodontology, Oral Pathology, Oral Medicine, General Medicine, General Surgery, Oral Surgery, Prosthodontics, Orthodontics, Operative Dentistry.

4 Years Curricular Framework

BDS SCHEME OF STUDIES

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

BDS Curriculum Map



BDS Programme Curricular Outcomes

At the end of four years dental undergraduate program, the graduates should be able to:

1. Independently assess the patients, order relevant investigations, and formulate a treatment plan.
2. Render treatments in the domain of general dental practitioners to their patients in time efficient and quality-controlled manner.
3. Practice evidence-based dentistry.
4. Correlate basic dental sciences knowledge and skills with clinical dental practice.
5. Modify dental treatments according to patient's special needs, if any, in the form of medical conditions, physical or mental disabilities etc.
6. Assess and refer the patients with case difficulty indices requiring consultation or treatment by specialists.
7. Show empathy and respect in their attitude and behavior towards their patients.
8. Maintain high ethical and professional standards in their pursuit of clinical excellence.
9. Draw upon their existing knowledge and update it through continuing education programs.
10. Exercise infection control protocol guidelines laid out by their local health councils.
11. Exercise management qualities to maintain single or multiple unit private practices where applicable.
12. Work in a team of other health care professionals including dentists, dental assistants, dental hygienists, laboratory technicians, ceramists and dental nurses etc.
13. Maintain patient records with emphasis on legal and patient confidentiality aspects.
14. Provide basic life support to patients requiring critical care in or outside dental set up.
15. Manage dental emergencies in a dental set up.
16. Demonstrate clear verbal and written communication skills.

Undergraduate Competencies for Dental Graduates

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 First Year BDS 2022

Coordinator Name	Department	Tel Extension
Prof. Dr. Ansa Rabia Professor	Anatomy	492
Prof. Dr. Tanzeela Akram Professor	Physiology	463
Prof. Dr. Saira Atif Associate Professor	Oral Biology & Tooth Morphology	335
Prof. Dr.Aamenah Malik Assistant Professor	Bio Chemistry	501

Hours of Teaching for Year 1 BDS for the Session

Sr. No.	Subject	Lecture & Tutorial hours	Practical/ Dissection hours	Self-study hours	Total hours at IOD	Hours required by PMDC
1	Anatomy	116	336	-	452	400
2	Physiology	152	66	36	254	250
3	Biochemistry	132	66	-	198	170
4	Oral Biology & Tooth Morphology	135	72	-	207	160
5	Islamiyat & Pakistan Studies	36	-	-	36	35



BIOCHEMISTRY STUDY GUIDE

First Year BDS Session 2022

Introduction to Biochemistry Department

Biochemistry department since the inception of the college has made a study and note-worthy progress. The department is headed by Prof Dr Aamenah Malik ably supported by a team of seasoned and experienced teachers. This department is well known for providing not only world class training to the undergraduates but also in breeding curiosity to know the unknown. The faculty members of this department who are highly qualified and dedicated are the source of inspiration for all their students to seek guidance for their academic and professional excellence. They along with the Head of Department have established an up-to-date laboratory as well as student lab that is an integrated life science teaching solution that include hardware, software and curriculum materials that students and faculty used to record data from their own bodies, animals or tissue preparations. A post graduate session has been established where, under permission from the NUMS University we hope to start our M.Phil (Biochemistry) classes in the very near future.

Aim

- To expedite the academic growth and development of the undergraduate students.
- To enhance the culture of research in both under and post graduate students.
- Development of trained medical faculty in basic sciences.

Resources

A. Teaching resources

B. Supporting staff

C. Infrastructure Resources

Teaching Resources

Faculty Members

Department of Biochemistry			
Faculty designated for BDS			
1	Dr. Aamenah Malik	Professor & HOD IOD	MBBS, M.Phil, CHPE
2	Dr. Khadeejah Anjum	Demonstrator	MBBS
3	Dr. Amna Noor	Demonstrator	BDS
4.	Dr. Zunaira Shakeel	Demonstrator	BDS

Supporting Staff

- Lab assistant/technician assistant/personal assistant - 2
- Computer operator - 1
- Lecture hall attendant -1
- Store keeper - 0

Infrastructure Resources

Sr. #.	Infrastructure Resources	Quantity
1	Lecture hall <ul style="list-style-type: none">• Seating Capacity 140• Multimedia• Microphone• Computer system• White Board	1
2	Biochemistry lab	1
3	Mini library	1

Teaching and Learning Strategies

Multiple educational methods will be used comprising of self-study, interactive lectures, group discussions, practical, and manual dexterity skill sessions.

(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
- Collaborative learning
- Self-study and reading from learning resources

(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
- Small group discussions
- Practical
- Self-directed learning
- Assignments

Interactive lectures

In large group, the lecturer introduces a topic which explains the underlying phenomena through questions, pictures, exercise, etc. Students are actively involved in the learning process.

Small group discussions

This format helps students to clarify concepts and acquire skills and attitudes. Students exchange opinions and apply knowledge gained from lectures and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

Practical and manual skills

In practical sessions students perform practical as assigned in the curriculum and syllabus provided by PMDC. They are also required to maintain a practical manual of the lab work. Understanding and effectively using the microscope, lab apparatus, blood pressure apparatus

Self- directed learning

Students' take responsibilities of their own learning through individual study, sharing and discussing with peers, 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 or afterwards for self-study.

Assignments

Students are given written formative assignments on designated topics.

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. Aamenah Malik(HOD IOD), Prof. Dr. Irum Fayyaz, , Dr. Huma Ashraf, Dr HiraSohail

(ii) Demonstrators for practical and tutorials sessions:

Dr Amna Noor, Dr Khadeejah Anjum

(iii) Support staff: Personal assistants, lab assistants, store keeper, lecture hall attendant, computer operator

Time Frame

Course duration: 36 weeks

Lectures: Monday (08:55 to 09:50am), Tuesday (12:10 to 01:05pm), Wednesday (08:00 to 08:55am), Friday (09:00 to 10:00am)

Practical: Wednesday (11:15am to 01:05pm), Thursday (01:05 to 03:00pm) Friday (11:00am to 01:00pm)

Learning Objectives

At the end of the session, first year BDS students should be able to:

S. No	Topic	Learning Outcome
1.	Introduction to Biochemistry	<ul style="list-style-type: none"> • What is Biochemistry? • The scope of biochemistry • Importance of biochemistry
2.	Biochemistry of cell	<ul style="list-style-type: none"> • Introduction to cell (biochemical point of view) • Scientific methods to study cell biochemistry • Biochemical composition of cell
3.	Biochemistry of body fluids	<ul style="list-style-type: none"> • Ionization of water and weak acids and bases • Concept of pH and pH scale • Dissociation constant & titration curve of weak acids, the concept of pK values • Buffers, their mechanism of action • Henderson-Hasselbalch Equation (No derivation) • Biomedical Importance of - Osmosis, Osmotic pressure, surface tension, viscosity & their importance related to body fluids
4.	Biological Membranes	<ul style="list-style-type: none"> • Biochemical composition • Biochemistry of cell membrane-chemical composition • Importance of lipid and proteins in membranes • Biomedical Importance of selectively permeable membranes • Chemistry of signals and receptors • Mechanisms of signal transduction (e.g G Proteins associated pathways) • Biochemistry of membrane transport mechanism -active transport, Passive transport, simple and facilitated diffusion and their biomedical role in human body
5.	Biochemistry of GIT	<ul style="list-style-type: none"> • Overview of digestion and absorption of Lipids, <ul style="list-style-type: none"> ○ Carbohydrates, Proteins • Introduction, composition, functions, secretion, stimulants and depressants of: - Saliva <ul style="list-style-type: none"> ○ Gastric juice ○ Bile ○ Pancreatic juice

S. No	Topic	Learning Outcome
		<ul style="list-style-type: none"> ○ Succusentericus
6.	Enzymes	<ul style="list-style-type: none"> ● Introduction, definition ● Mechanism of catalysis ● Coenzymes, co-factors and their Biomedical role in human body ● Isoenzymes, their clinical importance ● Factors affecting enzymes activity in the human body ● Michaelis-Menten Equation and its biomedical importance (no derivation of equations) ● Enzyme inhibitors and their classification and biomedical importance ● Regulation of enzyme activity-overview ● Application of enzymes in clinical diagnosis and therapeutic use
7.	Vitamins	<ul style="list-style-type: none"> ● Introduction, classification ● Fat soluble vitamins: chemistry, biochemical functions, deficiency manifestations, daily allowances, sources and hypervitaminosis ● Water soluble vitamins: chemistry, biochemical functions, deficiency manifestations, daily allowances, sources and hypervitaminosis
8.	Carbohydrate Chemistry	<ul style="list-style-type: none"> ● Definition, biochemical functions and classification ● The biomedical importance of carbohydrates ● Structure and functions of Monosaccharides, and their derivatives ● Disaccharides - their important examples ● Oligosaccharides-their combination with other macromolecules ● Polysaccharides- their important examples and biochemical role
9.	Carbohydrate Metabolism	<ul style="list-style-type: none"> ● Overview of major Metabolic pathways (Glycolysis, TCA cycle, Gluconeogenesis Glycogenesis, Glycogenolysis) their biomedical importance and hormonal regulation (Insulin, Glucagon) ● Glycolysis ● Phases and reactions of Glycolysis ● Energetics of Aerobic and Anaerobic glycolysis

S. No	Topic	Learning Outcome
		<ul style="list-style-type: none"> • The fate of Pyruvate • The Citric Acid Cycle • Reactions, energetics of Citric acid cycle • Diabetes Mellitus
10.	Protein Chemistry	<ul style="list-style-type: none"> • Definitions, Biomedical importance and classification of proteins based on: • Physiochemical properties • Functional properties • Nutritional properties • Amino acids, their structure, properties and functions • Classification and nutritional significance of amino acids • Structure of proteins and their significance • Separation of proteins e.g. salting out, Electrophoresis, Chromatography, Centrifugation • Plasma proteins & their clinical significance
11.	Protein Metabolism	<ul style="list-style-type: none"> • Amino acid oxidation, transamination, deamination, decarboxylation, deamidation and transamination • Transport of Ammonia • Ammonia intoxication • Urea cycle
12.	Porphyrin and Haemoglobin	<ul style="list-style-type: none"> • Chemistry and biosynthesis of haemoglobin • Structure, functions and types of haemoglobin • Oxygen binding capacity of hemoglobin, factors affecting and regulating the oxygen binding capacity of haemoglobin • Degradation of heme, formation of Bile pigments, its types, transport and excretion • Hyperbilirubinemia, their biochemical causes and differentiation • Jaundice and its types • Hemoglobinopathies (HP-S, Thalasemia) and their biochemical causes
13.	Lipid Chemistry	<ul style="list-style-type: none"> • Definition, biomedical function, Classification of lipids • Phospholipids, Glycolipids, Sphingolipids and their biochemical Significance • Fatty acids, chemistry, classification and biochemical function, Essential fatty acids • Eicosanoids, their classification and functions in health and disease • Steroids, sterol e.g. cholesterol, their chemistry, functions and clinical significance

S. No	Topic	Learning Outcome
14.	Lipid Metabolism	<ul style="list-style-type: none"> • Mobilization and transport of fatty acids, triacylglycerol, and sterols • Oxidation of fatty acids • Activation and transport of fatty acid in the mitochondria • B-oxidation, fate of Acetyl CoA • Ketogenesis and Ketolysis. Mechanism and utilization of Ketone bodies and significance • Overview of Lipoprotein Metabolism. • Cholesterol Synthesis (rate limiting step) • Hypercholesterolemia and atherosclerosis
15.	Nutrition	<ul style="list-style-type: none"> • Balanced Diet, DRIs (EAR, RDA, AI, UL), AMDR • Proteins (Protein turnover, Amino acid Pool, Nitrogen Balance, Protein Quality, Protein Requirement) • Biomedical importance, requirements of dietary Carbohydrates, Proteins and Lipids • Glycemic Index • Protein-Energy Malnutrition (Kwashiorkor, Marasmus)
16.	Minerals and Trace elements	<ul style="list-style-type: none"> • Classification and biochemical role of Macro minerals (Na, K , Ca, Cl, PO₄) • Classification and biochemical role of Micro minerals (Fe, Zn, Mg, Se, I, F, Cu, Cr, Cd, Mn)
17.	Nucleotides	<ul style="list-style-type: none"> • Nucleic acids, their types, structure and functions • Chemistry and structure of nucleotides and their biochemical role • Nucleotides, structure, their derivatives and their biochemical role
18.	Genetics and techniques	<ul style="list-style-type: none"> • Genetics and human disease • Molecular Biology and role in treatment of diseases

Learning Resources

Departmental library	
Textbook of Medical Biochemistry (MN Chatterjea)	8 th Edition
Lippincott's Biochemistry	7 th Edition
Pre Test Biochemistry and Genetics	4 th Edition
Instant Biochemistry (Faiq)	2 nd Edition
Biochemistry A Case-Oriented Approach	4 th Edition
Textbook of Physiology and Biochemistry	9 th Edition
Harper's Illustrated Biochemistry	29 th Edition
Hashmi's complete Textbook of Biochemistry	5 th Edition
BRS Biochemistry Molecular Biology & Genetics	5 th Edition
Kaplan Medical Biochemistry and Genetics	-
Essentials of Medical Biochemistry vol1	7 th Edition
Essentials of Medical Biochemistry vol 2	7 th Edition
Clinical chemistry : Principles, Methods and Interpretations	3 rd Edition
Textbook of Biochemistry with clinical correlations	6 th Edition
Clinical chemistry (MARSHALL)	2 nd Edition
Organic Chemistry (Vollhardt)	-
Mathews Van Holde Biochemistry	-
Recommended Books	
Textbook of Medical Biochemistry (MN Chatterjea)	
Lippincott's Biochemistry	
Harper's Illustrated Biochemistry	
Hashmi's complete Textbook of Biochemistry	
Essentials of Medical Biochemistry vol1	
Essentials of Medical Biochemistry vol 2	

Other Learning Resources

Hands-on activities	Students will be involved in practical session and hands-on activities to enhance learning.
Labs	Utilize the lab to relate knowledge to specimens and models available.
Videos	Animated videos of developmental histology to clear the concepts of the students shown during interactive lecture sessions.
Computer lab/CDs/DVDs/Internet resources	To increase the knowledge, students should utilize the available internet resources and CDs/DVDs in main IT lab/personal laptops.
Self-study	Self-study is incorporated to help the student in managing individual tasks/assignments. Student will search for information through available resources.

Technical Items in Biochemistry Lab

Sr. No	Items/ Nomenclature
86.	Centrifuge machine (Hettich EBA20)
87.	Digital balance (AND GR200)(Setra RS232)
88.	D/W Apparatus (Hamilton WSC/4)
89.	Microscopes (Austria MC50)
90.	Magnetic stirrer (VELP SCIENTIFICA)
91.	Over head projector (APPOLLO JL 3)
92.	Oven (Lab) (Binder ED53)
93.	Spectrophotometer (OPTIMA SP300)
94.	Water Bath (MEMMERT)
95.	Micro pipettes (Capp Aero Single & Techno)
96.	pH Meter (Jenway 3510)
97.	Stop watch (FAST TIME)
98.	DNA Model
99.	Glucometer (CC LEVER CHECK-TD 4225)
100.	Vortex Mixer (VELP SCIENTIFICA)
101.	Beaker (Glass) 1 L
102.	Beaker (Glass) 100 ML
103.	Beaker (Glass) 500 ML
104.	Beaker (Plastic) 1000 ML
105.	Burette 1000 ML With Bottle with stand
106.	Benson Burner
107.	Centrifuge Tube (Measuring)
108.	Centrifuge Tube (Plain)
109.	Centrifuge Tube (Plastic)
110.	Cylinder 1 L
111.	Cylinder 100 ML
112.	Cylinder 500 ML

Sr. No	Items/ Nomenclature
113.	Dropper (Glass) With Rubber
114.	Dropper Plastic
115.	Flask 100 ML Conical
116.	Funnel 6"
117.	FUNNEL SMALL 75 Mm
118.	Glass Rods
119.	Pipettes (Glass) 0.1 ML
120.	Pipettes (Glass) 1 ML
121.	Pipettes (Glass) 10 ML
122.	Pipettes (Glass) 2 ML
123.	Pipettes (Glass) 5 ML
124.	Pipette Stand
125.	Pipette Sucker
126.	Reagent Bottles Brown 1 L
127.	Reagent Bottles Brown 125 ML
128.	Reagent Bottles Brown 2.5 L
129.	Reagent Bottles Brown 500 ML
130.	Reagent Bottles White 125 ML
131.	Reagent Bottles White 2.5 L
132.	Reagent Bottles White 500 ML
133.	Safety Goggle
134.	Test Tube (disposable items)
135.	Test tube Holder
136.	Test tube Stand (Plastic)
137.	Test tube Stand (Steel)
138.	Test tube Tongs
139.	Tourniquet
140.	Tripod Stand
141.	Urinometer

Sr. No	Items/ Nomenclature
142.	Volumetric Flask 1 L
143.	Volumetric Flask 100 ML
144.	Volumetric Flask 250 ML
145.	Volumetric Flask 500 ML
146.	Washing brush
147.	Steel Mug
148.	Wire Gauze
149.	Sprit lamp
150.	Iron stand Rack for chemical
151.	Glass Rack
152.	Syringes cutter

Summative Assessment Methods and Policies

Internal Assessment

- Weightage of internal assessment shall be 10 %, each for theory and practical, in BDS Professional Examination.
- The Internal Assessment shall comprise of monthly test / assignments / class presentation / send-ups /class tests / OSPE etc.
- 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.
- The result of all the class tests / tools which contribute towards IA will be displayed to the students during an academic year.
- 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
- Internal assessment tools of any subject may be changed after the approval of respective FBS

Annual Examination

- The weightage of Annual Examination shall be 90%, each for theory and practical, in BDS.
- The examination comprises of a theory paper and practical/clinical examinations as per PM&DC regulations and the Table of Specifications (TOS) of the University.
- The gap between two consecutive theory papers shall not be more than two days.
- The Theory Paper shall be of 3-hours duration, held under the arrangements of the university. It shall have two parts; MCQs and SEQs for the year 2020. It may be changed after the approval of Academic Council.

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. 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

- 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.
- 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)
- The Controller of Examinations shall approve the faculty for the final paper setting having fair representation of each college / institute

Paper Assessment

- The Controller of Examinations shall approve the faculty for the theory paper marking, to be undertaken in the manner as deemed appropriate.

- The Examination Directorate shall coordinate directly with the faculty, earmarked for the paper marking
- A student who scores 85% and above marks in any subject shall qualify for distinction in that particular subject.
- 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 Examinations

- The Controller of Examiners shall approve the faculty to serve as the internal & external examiners.
- The number of external and internal examiners shall be equal.
- One external & internal examiner each shall be marked for a group of 100 students.
- Candidates may be divided into groups practical examinations and be standardized by incorporating OSPE stations.
- Practical 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.
- The assessment of the practical examination duly signed by internal & external examiner shall be furnished to the Controller of Examinations within one week of the conclusion of examination.

Pass Marks

- Pass marks for all subjects shall be 50 % in theory and practical, separately.
- 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 class

Re-totaling

Any student may apply to the Controller of Examinations on a prescribed form along with the 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.

Academic Audit

The Vice Chancellor may get any academic matter deliberated in the manner as deemed appropriate.

Issue of Academic Transcript/Detailed Marks Sheet

A student desirous of obtaining Academic Transcript / Detailed Mark Sheet may apply to Controller of Examinations along with the prescribed fee for each original copy.

Withdrawal/Failure

Any student who fails to clear the first Professional in BDS or first in four chances, availed or un-availed, shall be expelled as per PM& DC policy and shall not be eligible for fresh admission as a fresh candidate in either BDS.

Table of Specification (TOS) for Annual Examination

First Professional BDS Examination

BIOCHEMISTRY

Theory

Marks of Written Paper= 80

Marks of Internal Assessment= 20

Max Marks= 100

Pass Marks = 50

Time Allowed = 03 hrs

(Including MCQs)

Date:

40 x MCQs (on separate sheet)

(40 Marks)

(Time = 50min)

05 x SAQs/ SEQs (C1 & C2) = 04 marks each

04 x SAQs/ SEQs (C1 & C2) = 05 marks each

(40 Marks)

(Time = 2hrs 10 min)

S. No	Topic	Number of MCQs (40) 1 mark each		Number of SAQs/SEQs (09) • (05 x SAQs/ SEQs (C1 & C2) = 04 marks each • 04 x SAQs/ SEQs (C1 & C2) = 05 marks each
		Recall	Application	
1.	GIT + Nutrition	03	01	01 × 04 marks
2.	Lipids Chemistry & Metabolism	03	01	01 × 05 marks
3.	Chemistry of CHO & Metabolism	03	02	01 × 05 marks
4.	Minerals and Trace elements	03	02	01 × 04 marks
5.	Porphyrins & Hemoglobin	03	01	01 × 04 marks
6.	Protein & Amino Acids Chemistry of Metabolism	03	01	01 × 05 marks
7.	Enzymes	03	02	01 × 04 marks
8.	Nucleotides and Nucleic Acid, Genetics, Biochemistry of cell & BodyFluids + Biological membranes	03	01	01 × 04 marks
9.	Vitamins	03	02	01 × 05 marks
	Total	40 (40Marks)		09 (40 Marks)

Internal Assessment Calculation (Theory Annual)

A	B	C	D
Roll no.	Name	All terms, 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	

Table of Specifications for Annual Professional Exam: Practical

Viva 50 marks		Practical 30 marks			Total
Examiner 1	Examiner 2	Principal Writing	Practical Viva	Practical Notebook	
25 marks	25 marks	10 marks	15 marks	05 marks	80 marks

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	

Curriculum Map Biochemistry

