PREAMBLE

1. People’s Dental Academy (PDA) is a professional college where students are trained to become a good Dental surgeons with a thorough knowledge to treat dental and oral ailments. We wish to develop individual not only in dentistry but also general build up of their personality with respect to confidence, selfless service, social responsibility and professional etiquette.

2. PDA is a unique institution started by “Sarvajanik Jankalyan Parmarthik Nyas” Bhopal as a part of professional education. This Dental college has ethos of its own and since it is associated with the general public, it becomes duty of all students to ensure that the image of the institution is kept untarnished as also shining at all times.

3. PDA is an ISO 9001:2008 Certified institute.

4. PDA is recognised by Dental Council of India and is affiliated to Barkatullah University, Bhopal.

DRESS CODE:

The students must dress themselves properly, and appear decent and present themselves in the class room, clinical areas, library, auditorium/mess/parks/cafeteria and the Institute premises in befitting manner. The students must remove shoes/sandals/chappals etc., wherever it is notified to do.

White apron (half sleeves and length upto knees.) with name badge is must for are the students. All students must carry identity cards issued by the institute.

Use of two wheelers -

Parents are requested to encourage the students to utilize the bus facility provided by the college. However, if any student would like to use two wheeler, he/she should have all related legal documents & must use helmet. It is clarified that the college or the management will not be responsible for any accident occurring due to violation of traffic rules or negligent driving by the student.
SUBJECTS TAUGHT IN 1 year B.D.S,

A) Human Anatomy, Embryology, Osteology, and Histology

B) Human Physiology, Biochemistry, Nutrition and Dietics

C) Dental Materials

D) Preclinical prosthodontics, Crown & bridge

E) Dental Anatomy, Embryology & Oral Histology

However the University examination will be conducted in the following Subjects only at the end of first academic year.

A) Human Anatomy, Embryology, Osteology, and Histology

B) Human Physiology, Biochemistry, Nutrition and Dietics

C) Dental Anatomy, Embryology & Oral Histology.

INTERNAL ASSESSMENT EXAMINATIONS:

Internal assessment examinations are being conducted regularly either as a part of the university examinations or as a part of the training to assess the progress and preparedness of the students. No examination shall be missed on self presumption and assumptions that they are not essential or with the hope that the student can do better in the remaining examinations.

Proper and advance intimation of dates of internal assessment examinations are notified. The students shall not absent themselves for theory and practical classes before the Internal Assessment Examination.

COMPLAINT PROCEDURE:

Student who wishes to submit any suggestion/complaint regarding the working of any system/facility in the PDA hostel/campus against any PDA employee/persons working on contract with PDA must do so in writing to the Dean.

However the students having individual problems can approach Dean directly. Whereas Common problems shall be represented to the Dean through the respective class representatives only
RULES & REGULATIONS OF EXAMINATIONS

1. **SCOPE**: These regulations shall be applicable for the B.D.S. degree examinations conducted by Barkatullah university, Bhopal (Ordinance -177) as prescribed by DCI.

2. **PREFACE**:

   (A) Evaluation is a continuous process, which is based on criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the gauging effectiveness and quality of the concerned B.D.S. programme.

   (B) Evaluation is achieved by two processes

   1. Formative or internal assessment
   2. Summative or university examinations.

   Formative evaluation is done through a series of tests and examinations conducted periodically by the institution.

   Summative evaluation is done by the university though examination conducted at the end of the specified course.

3. **DURATION OF THE COURSE**:

   The undergraduate dental training programme leading to BDS degree shall be of 5 years with 240 teaching days in each academic year. During this period, the student shall be required to have engaged in full time study at a dental college recognized or approved by the Dental Council of India.

4. **ATTENDANCE REQUIREMENT, PROGRESS AND CONDUCT**

   (i) 75% in theory and 75% in practical / clinical in each year.

   (ii) In case of a subject in which there is no examination a the end of the academic year / semester, the percentage of attendance shall not be less than 70%. However, at the time of appearing for the professional examination in the subject, the aggregate percentage of attendance in the Subject should satisfy condition (i) above.

5. **METHODS OF EVALUATION**:

   Evaluation are achieved by the following methods:

   1. Written test
   2. Practicals
   3. Clinical Examination
   4. Viva voce
   5. Monthly Test
6. INTERNAL ASSESSMENT EXAMINATION:

The continuing assessment examinations may be held frequently at least 3 times in a particular year and the average marks of these examinations should be considered. 10% of the total marks in each subject for both theory, practical or clinical examination separately should be set aside for the internal assessment examinations.

7. SCHEME OF EXAMINATION:

The scheme of examination for B.D.S. Course shall be divided into 1st B.D.S. examination at the end of the first academic year, 2nd B.D.S examination at the end of second year, 3rd B.D.S. examination at the end of third, 4th B.D.S. at the end of 4th and final B.D.S. at the end of 5th year. 240 days minimum teaching in each academic year is mandatory.

The examination shall be open to a candidate who satisfies the requirements of attendance, progress and other rules laid down by the University.

University shall organize admission timings and admission process in such a way that teaching starts from 1st day of August in each academic year. However the commencement of academic session will also depend in the completion of admission process.

Ist. B.D.S. Examination: Subjects

1. General anatomy including embryology and histology.
2. General human physiology and biochemistry
3. Dental anatomy, Embryology and Oral Histology

Any student who does not clear the first BDS University Examination in all subjects within 3 years from the date of admission, shall be discharged from the Course.

Any candidate who fails in one subject in an Examination is permitted to go to the next higher class and appear for the subject and complete it successfully before he is permitted to appear for the next higher examination.

IInd. B.D.S. Examination: Subjects

A candidate who has not successfully completed the 1st B.D.S. examination can not appear in the IInd year Examination.

1. General pathology and Microbiology.
2. General and dental pharmacology and therapeutics
3. Dental Materials
4. Pre Clinical Conservative – Only Practical and Vice Voce
5. Pre Clinical Prosthodontics – Only Practical and Viva Voce

IIIrd. B.D.S. Examination: Subjects

A candidate who has successfully completed the 2nd B.D.S. examination can appear IIIrd B.D.S. Examination.

1. General Medicine
2. General Surgery
3. Oral Pathology and Oral Microbiology

IVth. B.D.S. Examination: Subjects

1. Oral medicine and radiology
2. Paediatric & Preventive Dentistry
3. Orthodontics & dentofacial orthopaedics
4. Periodontology
Vth. B.D.S. Examination:

1. Prosthodontics and Crown & Bridge
2. Conservative Dentistry and Endodontics
3. Oral and Maxillofacial Surgery
4. Public Health Dentistry

WRITTEN EXAMINATION:

1. The written examination in each subject shall consist of one paper of three hours duration and shall have maximum marks of 70.
2. In the subjects of Physiology & Biochemistry and Pathology & Microbiology each paper will be divided onto two parts, A and B of equal marks.
3. The question paper should contain different types of questions like essay, short answer and objective type / M.C.Q's
4. The nature questions set, should be aimed to evaluate students of different standards ranging from average to excellent.
5. The questions should cover as broad an area of the content of the course. The essay questions should be properly structured and the marks specifically allotted.

The University may set up a question bank

PRACTICAL AND CLINICAL EXAMINATION:

1. Objective structured Clinical Evaluation: The present system of conducting practical and clinical examination at several universities provide chance for unrealistic proportions of luck. Only a particular clinical procedure or experiment is usually given for the examination. The clinical and practical examination should provide a number of chance for the candidate to express one’s skills. A number of examination stations with specific instructions to be provided. This can include clinical procedures, laboratory experiments, spotters etc. Evaluation must be made objective and structured. The method of objective structured clinical examinations should be followed. This will avoid examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each station.
2. Record/Log Books: The candidate should be given credit for his records based on the scores obtained in the record. The marks obtained for the record in the first appearance can be carried over to the subsequent if necessary.
3. Scheme of clinical and practical examinations: The specific scheme of clinical and practical examinations, the type of clinical procedures / experiments to be performed and marks allotted for each are to be discussed and finalized by the Chairman and other examiner and it is to be published prior to the conduct of the examinations along with the publication of the time table for the practical examinations. This scheme should be brought to the notice of the external examiner as and when the examiner reports. The practical and clinical examinations should be evaluated by two examiners of which one state. Shall be an external examiner appointed form other universities. Each candidate should be evaluated by each examiner independently and marks computed at the end of the examination.
4. Viva Voce: Viva voce is an excellent mode of assessment because it permits a fairly broad coverage and it can assess the problem solving capacity of the student. An assessment related to the affective domain is also possible through viva voce. It is desirable to conduct the viva voce independently by each examiner. In order to avoid vagueness and to maintain uniformity of standard and coverage, questions can be pre-formulated before administering them to each student. Twenty marks are exclusively allotted for vive voce and that can be divided equally amongst the examiners, i.e., 10 marks per examiner.
MARKS DISTRIBUTION IN EACH SUBJECT:

Each subject shall have a maximum of 200 marks.
Theory 100
Practical / Clinical 100

<table>
<thead>
<tr>
<th>Subject</th>
<th>Theory-100</th>
<th>Practical / clinical - 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>University written exam</td>
<td>70</td>
<td>University Exam 90</td>
</tr>
<tr>
<td>Viva Voce</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Internal assessment (Theory)</td>
<td>10</td>
<td>Internal assessment (Practical) 10</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>Total 100</td>
</tr>
</tbody>
</table>

Practical and Viva Voce Only in University Examination
Pre-clinical
Prosthodontics
Pre-clinical Conservative Dentistry.

<table>
<thead>
<tr>
<th>Subject</th>
<th>-</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Assessment</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Practical</td>
<td>-</td>
<td>60</td>
</tr>
<tr>
<td>Viva Voce</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Pass Criteria:

There are two passing heads for each subject i.e written (including viva voce and internal assessment) and practicals (including internal assessment) Candidate must score 50% in each passing head separately.

For declaration of passing in a subject, a candidate shall secure 50% marks in the University examination both in Theory and Practical / Clinical examinations separately, as stipulated below:

◆ A candidate shall secure 50% marks in aggregate in University theory including Viva Voce and Internal assessment obtained in University written examination combined together.
◆ In the University Practical / clinical examination, a candidate shall secure 50% of University practical marks and Internal Assessment combined together.
◆ In case of pre clinical Prosthetic Dentistry and Pre clinical conservative dentistry in II BDS, where there is no written examination, minimum for passing is 50% of marks in Practical and Viva voce combined together in University examination including Internal Assessment i.e. 50 / 100 marks.
◆ The successful candidates will be placed in Second Class. A candidate who obtains 75% and above is eligible of Distinction. Only those candidates who pass the whole examination in the first attempt will be eligible for distinction or class.
◆ Distinction is awarded by the University as per their respective rules.
**Grace Marks:** Grace marks up to a maximum of 5 marks may be awarded to students who have failed only in one subject and passed in all other subjects.

**Re-evaluation:** The objective of re-evaluation is to ensure that the student receives a fair evaluation in the university examination and to minimize human error and extenuating circumstance. There shall be two mechanisms for this purpose.

1. **Re-totaling:** The University on application and remittance of a stipulated fee to be prescribed by the university, shall permit a recounting or opportunity to recount the marks received for various questions in an answer paper/papers for theory of all subjects for which the candidate has appeared in the university examination. Any error in addition of the marks awarded if identified should be suitably rectified.

2. **Re-evaluation:** Re-evaluation of theory papers in all years study of the BDS course may be permissible by the university on application and remittance of the prescribed fee.
# PEOPLE'S DENTAL ACADEMY, BHOPAL
## BDS - 1st Year Time Table - Session 2010-2011

**NO. : PDA/Reg/10/**

**Date : 01/09/2010**

<table>
<thead>
<tr>
<th>Days</th>
<th>9 AM to 10 AM Lecture</th>
<th>10 AM to 11 AM Lecture</th>
<th>11 AM to 1 PM Practical</th>
<th>Batch</th>
<th>1PM to 2PM</th>
<th>2 PM to 4 PM</th>
<th>Batch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>Physiology</td>
<td>Anatomy</td>
<td>Anatomy, Prosthodontics Pre-Clinical DA/DH</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>Tuesday</td>
<td>Conservative Dentistry</td>
<td>Physiology</td>
<td>Anatomy, Prosthodontics Pre-Clinical DA/DH</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Wednesday</td>
<td>Biochemistry</td>
<td>Dental Material</td>
<td>Anatomy, Prosthodontics Pre-Clinical DA/DH</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td>Thursday</td>
<td>Dental Anatomy &amp; Dental Histology</td>
<td>Anatomy</td>
<td>Anatomy, Dental Material Library</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Friday</td>
<td>Physiology</td>
<td>Anatomy</td>
<td>Anatomy, Dental Material Library</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Saturday</td>
<td>Physiology</td>
<td>Dental Anatomy &amp; Dental Histology</td>
<td>Anatomy, Dental Material Library</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
</tr>
</tbody>
</table>

**Lunch**
- Dental Anatomy & Histology Library
- Physiology Library
- Biochemistry
- Physiology Dental Anatomy & Histology Biochemistry
- Physiology Library Biochemistry
- Theory Classes
  - a) Biochemistry – 2 PM to 3 PM
  - b) DA/Dh – 3 PM to 4 PM

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**BATCHES – FOR PRACTICAL CLASSES**

<table>
<thead>
<tr>
<th>Batch- A</th>
<th>Roll No: 1 to 33</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch- B</td>
<td>Roll No: 34 to 66</td>
</tr>
<tr>
<td>Batch- C</td>
<td>Roll No: 67 onwards</td>
</tr>
</tbody>
</table>

(Dr. D.C. Mishra)
Registrar
SYLLABUS OF STUDY

1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY AND MEDICAL GENETICS

A) GOAL

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical and scientific foundations are laid down for clinical years of the BDS course.

B) OBJECTIVES:

a) KNOWLEDGE & UNDERSTANDING.

At the end of the 1st Year BDS Course in Anatomical Sciences the undergraduate courses is Expected to:

1. Know the normal disposition of the structures in the body while clinically examine a patient and while conducting clinical procedures.
2. Know the anatomical basis of disease and injury.
3. Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.
4. Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
5. Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutation and environmental hazards.
6. Know the sectional anatomy of head, neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.
7. Know the anatomy of cardio-pulmonary resuscitation.

b) SKILLS

1. To locate various structures of the body and to mark the topography of the living anatomy.
2. To identify various tissues under microscope.
3. To identify the features in radiographs and modern imaging techniques.
4. To detect various congenital abnormalities.

C) INTEGRATION

By emphasizing on the relevant information and avoiding unwanted details, the anatomy taught integrally with other basic sciences and clinical subjects not only keeps curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit of the society.

This insight is gained in a variety of ways:

1) Lectures and small group teaching
2) Demonstrations
3) Dissection of the Human cadaver
1) Study of dissected specimens  
2) Osteology  
3) Surface anatomy on living individual  
4) Study of radiographs and other modern imaging techniques.  
5) Study of Histology slides  
6) Study of embryology models  
7) Audio-visual aids  

Throughout the course, particular emphasis is placed of the functional correlation, clinical application and on integration with teaching in other biomedical disciplines.

D) AN OUTLINE OF THE COURSE CONTENT:

1. General Anatomy: Introduction of anatomical terms and brief outline of various systems of the body.  
2. Regional anatomy of head and neck with osteology of bones of head and neck, with emphasis on topics of dental importance.  
3. General disposition of thoracic, abdominal and pelvic organs.  
4. The regional anatomy of the sites of the intramuscular and intra vascular injections, & lumbar puncture.  
5. General embryology & systemic with respect to development of head and neck.  
6. Histology of basic tissues and of the organs of gastrointestinal, respiratory, Endocrine, excretory systems & gonads.  
7. Medical genetics

E) FURTHER DETAILS OF THE COURSE

I. INTRODUCTION TO:

1. Anatomical terms.  
2. Skin, superficial fascia & deep fascia  
3. Cardiovascular system, portal system collateral circulation and arteries.  
4. Lymphatic system, regional lymph nodes  
5. Osteology – Including ossification & growth of bones  
6. Myology – Including types of muscle, tissue and innervation.  
7. Syndesmology – Including classification of joints.  
8. Nervous system

II. HEAD & NECK

05. Orbital Cavity – Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit.  
III. THORAX: Demonstration on a dissected specimen of
1. Thoracic wall
2. Heart Chambers
3. Coronary arteries
4. Pericardium
5. Lungs – surfaces; pleural cavity
6. Diaphragm

IV. ABDOMEN: Demonstration on a dissected specimen of
1. Peritoneal cavity
2. Organs in the abdominal and pelvic cavity.

V. CLINICAL PROCEDURES
a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.
   1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
   2. Gluteal region and its relation of the sciatic nerve.
   3. Vastus lateralis muscle.
b) Intravenous injections & venesection: demonstration of veins in the dissected specimen and on a living person.
c) Arterial pulsations: Demonstrations of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person
d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equine & epidural space and the inter vertebral space between L4 and L5.

VI. EMBRYOLOGY:
Oogenesis, spermatogenesis, Fertilization, Placenta, Primitive streak, Neural crest, Bilaminar and trilaminar embryonic disc, Intra embryonic mesoderm- formation and fate, notochord formation and fate, Pharyngeal arches, puches and clefts. Development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands and anomalies in their development, Tooth development in brief.

VII. HISTOLOGY:
The Cell:
VIII. MEDICAL GENETICS:
Mitosis, meiosis, Chromosomes, gene structure, Mendelism, modes of inheritance

RECOMMENDED BOOKS:
1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown & company, Boston.
5. SADLER, LANGMAN’S, Medical Embryology, ED.6.
6. JAMES E ANDERSON, Grant’s Atlas of Anatomy, Williams & Wilkins.
7. WILLIAMS, Gray’s Anatomy, ED.38, Churchill Livingstone.
8. EMERY, Medical Genetics.

2. HUMAN PHYSIOLOGY

A) GOAL
The broad goal of the teaching undergraduate students in Human Physiology aims at providing the students comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

OBJECTIVES

a) KNOWLEDGE
At the end of the course, the student will be able to:

1. Explain the normal functioning of all the organ systems and their interaction for well coordinated total body function.
2. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
3. List the physiological principles underlying the pathogenesis and treatment of disease.

b) SKILLS
At the end of the course, the student shall be able to:

1. Conduct experiments designed for the study of physiological phenomena.
2. Interpret experimental and investigative data
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

C) INTEGRATION
At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.
B) COURSE CONTENTS THEORY

1. GENERAL PHYSIOLOGY
   1. Homeostasis: Basic concept, Feedback mechanisms
   2. Structure of cell membrane, transport across cell membrane
   3. Membrane potentials

2. BLOOD:
   Composition & functions of blood.
   Specific gravity, packed cell volume, factors affecting & methods of determination.
   Plasma proteins – Types, concentration, functions & variations.
   Erythrocyte – Morphology, functions and variations. Erythropoiesis & factors affecting erythropoiesis.
   ESR- Methods of estimation, factors affecting, variations and significance.
   Haemoglobin – Normal concentration, method of determination & variation in concentration.
   Blood Indices – MCV, MCH, MCHC – definition, normal values, variation.
   Anaemia – Definition, classification, life span of RBS’s destruction of RBC’s, formation and fate of bile pigments, Jaundice – types.

Leucocytes: Classification, number, percentage, distribution morphology, properties functions and variations. Role lymphocytes in immunity, leucopoiesis life span & fate of leucocytes.

Thrombocytes – Morphology, number, variations and function & thrombopoiesis.

Haemostasis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.

Tests of haemostatic function, platelet count clotting time, bleeding time, prothrombin time – normal values, method and variations. Anticoagulants – mechanism of action, Bleeding disorders.

Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.

Blood volume: Normal values variations.

Body fluids: distribution of total body water, intracellular and extracellular compartments, major anions and cations in intra and extra cellular fluid.

Tissue fluids and lymph: Formation of tissue fluid, composition, circulation & functions of lymph.

Odema – causes.

Functions of reticulo endotelial system.

3. MUSCLE AND NERVE

4. DIGESTIVE SYSTEM
   Introduction to digestion: General structure of G.I. tract, Innervations.
   Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.
   Exocrine Pancreas – Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.
   Liver: structure, composition of bile, functions of bile, regulation of secretion – Gall bladder: structure, functions.
Small intestine – Composition, functions & regulation of secretion of intestinal juice.
Large intestine – Functions.
Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

5. EXCRETORY SYSTEM

Structure & functions of kidney, functional unit of kidney & functions of different parts.
Juxta glomerular apparatus, renal blood flow.
Mechanism of concentration & dilution of urine.
Role of kidney in the regulation of pH of the blood.
Micturition: anatomy & innervation of Urinary bladder, mechanism of micturition & abnormalities.

6. BODY TEMPERATURE & FUNCTIONS OF SKIN

7. ENDOCRINOLOGY

Hormones of anterior pituitary & their actions, hypothamic regulation of anterior pituitary function.
Disorders of secretion of anterior pituitary hormones.
Posterior pituitary: Functions, regulation & disorders of secretion.
Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion of hormones and disorders.
Other hormones – Angiotenon, A.N.F.

8. REPRODUCTION

Sex differentiation, Physiological anatomy of male and female sex organs, Female reproductive system: Menstrual cycle, functions of ovary, actions of oestrogen & Progesterone, control of secretion of secretion of ovarian hormones, tests for ovulation, fertilization, implantation, maternal changes during pregnancy, pregnancy tests and parturition. Lactation, composition of milk, factors controlling location, milk ejection, reflex, Male reproductive system: spermatogenesis, semen and contraception.

9. CARDIO VASCULAR SYSTEM

Functional anatomy and innervation of heart Properties of cardiac muscle Origin and propagation of cardiac impulse and heart block.
Electrocardiogram – Normal electrocardiogram. Two changes in E.C.G. in myocardial infraction.
Cardiac cycle – Phases, pressure changes in atria, ventricles & aorta.
Volume changes in ventricles. Jugular venous pulse, arterial pulse.
Heart sounds: Mention of murmurs.
Heart rate: Normal value, variation and regulation.
Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.
Arterial blood pressure: Definition, normal values & variations, determinants, regulation & measurement of blood pressure.
Coronary circulation
10. RESPIRATORY SYSTEM

Physiology of Respiration: External and internal respiration.
Functional anatomy of respiratory passage and lungs.
Respiratory movements: Muscles of respiration, Mechanism of inflation and deflation of lungs.
Intra pleural & intra pulmonary pressures and their changes during the phase of respiration.
Mechanics of breathing – surfactant, compliance & work of breathing.
Spirometry: Lung volumes & capacities definitions, normal values, significance, factors affecting vital capacity, FEV & its variations.
Composition of inspired air, alveolar ventilation and dead space – ventilation.
Composition of inspired air, alveolar air and expired air.
Transport of oxygen & carbon dioxide in the blood.
Regulation of respiration – neural and chemical.
Hypoxia, cyanosis, dyspnoea, periodic breathing.
Artificial respiration, pulmonary function tests.

11. CENTRAL NERVOUS SYSTEM

1. Organisation of central nervous system.
2. Neuronal Organisation at spinal cord level
3. Synapse receptors, reflexes, sensations and tracts
4. Physiology of pain
5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex.
6. Formation and function of CSF
7. Autonomic nervous system

12. SPECIAL SENSES

Fundamental knowledge of vision, hearing, taste and smell.

PRACTICALS

The following list of practical is minimum and essential. All the practical have been categorized as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University Practical examination. Those categorized as demonstrations are to be included in the University Practical examination. Those categorized as demonstrations are to be shown to the students during practical classes. However, these demonstrations would not be included in the University examination but questions based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

PROCEDURES

1. Enumeration of Red Blood Cells
2. Enumeration of White Blood Cells
3. Differential leucocyte counts
4. Determination of Haemoglobin
5. Determination of blood group
6. Determination of bleeding time and clotting time.
7. Examination of pulse
8. Recording of blood pressure

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DEMONSTRATION
1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood.
3. Determination of erythrocyte fragility.
4. Determination of vital capacity and timed vital capacity.
5. Skeletal muscle experiments
7. Clinical examination of cardiovascular and respiratory system.

TEXT BOOKS:
Guyton; Text book of Physiology, 9th edition
Ganong; Review of Medical Physiology, 19th edition
Vander; Human Physiology, 5th edition
Choudhuri; Concise Medical Physiology, 2nd edition
Chaterjee; Human Physiology, 10th edition
A. K. Jain; Human Physiology for BDS students, 1st edition

BOOKS FOR REFERENCE
i) Berne & Levey; Physiology, 2nd edition

EXPERIMENTAL PHYSIOLOGY
i) Rannade; Practical Physiology, 4th edition
ii) Ghai; a text book of practical physiology
iii) Hutchison's; Clinical methods, 20th edition

BIOCHEMISTRY

AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. The contents should be organized to build on the already existing information available to the students in the pre-university stage and reorienting. A mere rehash should be avoided.

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organize macromolecules. Details on structure need not be emphasized.

Discussion on metabolic processes should put emphasis on the overall change, interdependence and molecular turnover. While details of the steps may be given, the student should not be expected to memorize them. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamins, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic
regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical expects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

At the end of the course the student would be able to acquire a useful core of information, which can be retained for a long time. Typical acid tests can be used to determine what is to be taught and what is to be learnt. A few examples are given below.

1. Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma.
2. Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.
3. Need not know the details of alpha – helix and beta – pleats in proteins. Should know why haemoglobin is globular and Keratin is fibrous.
4. Need not know mechanism of oxidative phosphorylation
   Should know more than 90 % of ATP is formed by this process.
5. Need not know details of the conversion of pepsinogen to pepsin.
   Should know hydrochloric acid cannot break a peptide bond at room temperature.
6. Need not remember the steps of glycogenesis.
   Should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.
7. Need not know about urea or creatinine clearance tests.
   Should know the basis of increase of urea and creatinine in blood in renal insufficiency.
8. Need not know the structure of insulin.
   Should know why insulin level in circulation is normal in most cases of maturity onset diabetes.
9. Need not know the structural details of ATP.
   Should know why about 10 g of ATP in the body at any given time meets all the energy needs.
10. Need not know the mechanism of action of prolylhydroxylase.
    Should know why the gum bleeds in scurvy.
11. Need not know the structure of Vitamin K.
    Should know the basis of internal bleeding arising due to its deficiency.
12. Need not remember the structure of HMGCoA.
    Should know why it does not lead to increase cholesterol synthesis in starvation.
BIOCHEMISTRY AND NUTRITION

1. CHEMISTRY OF BIOORGANIC MOLECULES
   Nucleic acids: Building units: Nucleotides. Outline structure of DNA and RNA.
   High energy compounds: ATP, Phosphorylamidines, Thioesters, Enol phosphates.

2. MACRONUTRIENTS AND DIGESTION

3. MICRONUTRIENTS

4. ENERGY METABOLISM

5. SPECIAL ASPECTS OF METABOLISM
6. BIOCHEMICAL GENETICS AND PROTEIN SYNTHESIS
Introduction to nucleotides, formation and degradation. DNA as generic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Introduction to cancer, viruses and oncogenes.

7. ENZYME AND METABOLIC REGULATION

8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS
Introduction to cytoskeleton. Myofibril and muscle contraction in brief.
Plasma lipoproteins: Formation, function and turnover.

9. MEDICAL BIOCHEMISTRY

PRACTICALS: Contact hours 50
1. Qualitative analysis of carbohydrates
2. Color reactions of proteins and amino acids
3. Identification of nonprotein nitrogen substance
4. Normal constituents of urine
5. Abnormal constituents of urine
6. Analysis of saliva including amylase
7. Analysis of milk Quantitative estimations
8. Titrable acidity and ammonia in urine
9. Free and total acidity in gastric juice
10. Blood glucose estimation
11. Serum total protein estimation
12. Urine creatinine estimation Demonstration
13. Paper electrophoresis charts / clinical data evaluation
14. Glucose tolerance test profiles
15. Serum lipid profiles 1
16. Profiles of hypothyroidism and hyperthyroidism 1
17. Profiles of hyper and hypoparathyroidism 1
18. Profiles of liver function 1
19. Urea, uric acid creatinine profile in kidney disorders 1
20. Blood gas profile in acidosis / alkalosis 1

RECOMMENDED BOOKS:
3. Lecture notes in Biochemistry 1984, J.K. Kandlish

REFERENCE BOOKS:
3. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C. Elliot
4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

INTRODUCTION
Dental Anatomy including Embryology and Oral Histology – a composite of basic Dental Sciences & their clinical applications.

SKILLS
The student should acquire basic skills in:
Carving of crowns of permanent teeth in wax.
Microscopic study of Oral tissues.
Identification of Deciduous & Permanent teeth.
Age estimation by patterns of teeth eruption from plaster casts of different age groups.

OBJECTIVES
After a course on Dental Anatomy including Embryology and Oral Histology,
1. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological / non-pathological states.
2. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
3. The students must know the basic knowledge of various research methodologies.

I. TOOTH MORPHOLOGY
1. Introduction to tooth morphology:
   ❖ Human dentition, types of teeth & functions, Palmer’s & Binomial notation systems, tooth surfaces, their junctions – line anges & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures – Clinical significance.
2. Morphology of permanent teeth:
   ❖ Description of individual teeth, along with their endodontic anatomy, differences between similar class of teeth & identification of individual teeth.
   ❖ Variations & Anomalies commonly seen in individual teeth.
3. Morphology of Deciduous teeth:
   - Generalized differences between deciduous & Permanent teeth.
   - Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.

4. Occlusion:
   - Definition, factors influencing occlusion – basal bone, arch, individual teeth, external & internal forces & sequence of eruption.
   - Inclination of individual teeth – compensatory curves.
   - Centric relation & Centric occlusion – protrusive, retrusive & lateral occlusion.
   - Clinical significance of normal occlusion.
   - Introduction to & Classification of Malocclusion.

II. ORAL EMBRYOLOGY
1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.
2. Development of teeth:
   - Epithelial mesenchymal interaction, detailed study of different stages of development of crown, root & supporting tissues of tooth & detailed study of formation of calcified tissues.
   - Applied aspects of disorders in development of teeth.

3. Eruption of deciduous & Permanent teeth:
   - Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.
   - Clinical or Applied aspects of disorders of eruption.
4. Shedding of teeth:
   - Factors & mechanisms of shedding of deciduous teeth.
   - Complications of shedding.

III. ORAL HISTOLOGY
1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations – Fluoride applications, transparent dentine; dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine; Pulp calcifications & Hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, movement, applied aspects of alveolar bone resorption.
4. Salivary Glands:
- Detailed microscopic study of acini & ductal system.
- Age changes & clinical considerations

5. TM Joint:
- Review of basic anatomical aspects & microscopic study & clinical considerations.

6. Maxillary Sinus:
- Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.

7. Processing of Hard & soft tissues for microscopic study:
- Ground sections, decalcified sections & routine staining procedures.

8. Basic histochemical staining patterns of oral tissues.

IV. ORAL PHYSIOLOGY

1. Saliva:
- Composition of saliva – variations, formation of saliva & mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.

2. Mastication:
- Masticatory force & its measurement – need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.

3. Deglutition:
- Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.

4. Calcium, Phosphorous & fluoride metabolism:
- Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper phosphatemia & fluorosis.

5. Theories of Mineralization:
- Definition, mechanisms, theories & their drawbacks.
- Applied aspects of physiology of mineralization, pathological considerations – calculus formation.

6. Physiology of Taste:
- Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes and applied aspects – taste disorders.

7. Physiology of Speech:
- Review of basic anatomy of larynx & vocal cords.
- Voice production, resonators, production of vowels & different consonants – Role of palate, teeth & tongue.
- Effects of dental prosthesis & appliances on speech & basic speech disorders.
RECOMMENDED TEXT BOOKS
2. Oral Development & Histology – James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion – Major M.Ash
4. Dental Anatomy – its relevance to dentistry – Woelfel & Scheid
5. Applied Physiology of the mouth – Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins