ANNOOR DENTAL COLLEGE & HOSPITAL

Affiliated to Mahatma Gandhi University & Kerala University of Health Sciences
Recognised by Dental Council of India and Govt of India)
Muvattupuzha-686673, Ernakulam Dist, Kerala, India
E Mail: annoordentalcollege@rediffmail.com website:www.annoordentalcollege.org
Ph: 0485-2815217 Fax : 0485-2815817

1.2.1 Percentage of inter-disciplinary / inter-departmental courses /training across all the Programmes offered by the College during the last five years

INDEX SHEET

ANNOOR DENTAL COLLEGE Muvattupuzha 686 673 Perumattom, Puthuppady P.O.

Dr. Giju George Baby
Principal
Annoor Dental College & Hospital
Muvattupuzha - 686673

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CERTIFICATE OF THE HEAD OF THE INSTITUTION

ANNOOR DENTAL COLLEGE * P.O. Kizhakkekara * Perumattom, Muvattupuzha 686 673

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TO WHOMSOEVER IT MAY CONCERN

This is to Certify that the following chart includes the percentage of inter-disciplinary / inter-departmental courses /training across all the Programmes offered by the College during the last five years are given below :

Year	2018-19	2017-18	2016-17	2015-16	2014-15
Percentage of inter – disciplinary / inter - department courses/ training	86	86	86	86	86

PRINCIPAL

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LIST OF INTERDISCIPLINARY /INTERDEPARTMENTAL COURSES /TRAINING ACROSS ALL THE THE PROGRAMMES OFFERED BY THE UNIVERSITY DURING THE LAST 5 YEARS

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Program Code	Program Name	Course code	Name of the course	Interdisciplinary course	Interdepartmental course
2	BDS	1	General Anatomy including Embryology and Histology	✓	
		2	General Human Physiology	✓	
		3	Biochemistry	✓	
		4	Dental Anatomy, Embryology and Oral histology		✓
		5	General Pathology	✓	
		6	General Microbiology	✓	
		7	Dental Materials		✓
		8	General and Dental Pharmacology & Therapeutics	✓	
		9	General Medicine	✓	
		10	General Surgery	✓	
		11	Oral Pathology &Oral Microbiology		✓
		12	Public Health Dentistry		✓
		13	Periodontology		✓
		14	Oral Medicine & Radiology		✓
		15	Orthodontics & Dentofacial Orthopaedics		✓
		16	Oral & Maxillofacial Surgery		✓
		17	Conservative Dentistry & Endodontics		✓
		18	Prosthodontics and Crown & Bridge		✓
		19	Paediatric & Preventive Dentistry		✓
241	MDS-Prosthodontics and Crown & Bridge	1	Applied Anatomy, Physiology, Pathology & Dental Materials	✓	✓
		2	Removable Prosthodontics,Oral Implantology, Fixed Prosthodontics		✓
242	MDS-Periodontology	1	Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology & Biostatistics	✓	
		2	Clinical & Therapeutic		✓

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			Periodontology, Oral Implantology		
244	MDS - Conservtaive Dentistry & Endodontics	1	Applied anatomy,Physiology, Pathology, Dental Materials	✓	✓
245	MDS- Orthodontics & Dentofacial Orthopedics	1	Applied Basic Sciences, Applied Anatomy, Physiology, Dental Materials, Genitics, Pathology, Applied Pharmacology, Applied Research Methodology and Biostatistics	✓	✓
246	MDS-Oral Pathology & Microbiolgy	1	Applied anatomy,Physiology, Biochemistry,Pathology, Research Methodology	✓	
247	MDS- Pedodontics and Preventive Dentistry	1	Applied Basic Sciences, Applied Anatomy, Physiology, Dental Materials, Genetics, Pathology, Microbiology, Nutrition and Dietetics	✓	✓
		2	Preventive & Community Dentistry		✓

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INSTITUTIONAL DATA IN PRESCRIBED FORMAT

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Key Indicator – 1.2 Academic Flexibility (30)

1.2.1 Percentage of interdisciplinary/interdepartmental courses/training across the Programmes offered by the college during the last five years

Year	Name of the programe	No. of courses where inter/transdisciplinary training/postings were built in the programme
2018-19	BDS	19
	MDS	9
2017-18	BDS	19
	MDS	9
2016-17	BDS	19
	MDS	7
2015-16	BDS	19
	MDS	7
2014-15	BDS	19
	MDS	7

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ANY OTHER RELEVANT INFORMATION

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Bachelor of Dental Surgery [B.D.S]

Course Code 002

(2016-17 Academic year onwards)

2016

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2.6 Syllabus

(The syllabus given below is a guideline and is not intended to restrict the student from learning relevant topics not mentioned herein and is not intended to restrict the examiner in assessing the extent of knowledge of the student in the subject)

1. GENERAL HUMAN ANOTMY INCLUDING EMBRYOLOGY AND HISTOLOGY

a) GOAL

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

b) OBJECTIVES:

i. Knowledge & understanding:

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student is expected to:

(1) Know the normal disposition of the structures in the body while clinically examining 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 mutations 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.

ii. 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 & clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways:

i. Lectures & small group teaching
ii. Demonstrations
iii. Dissection of the human cadaver
iv. Study of dissected specimens
v. Osteology
vi. Surface anatomy on living individual
vii. Study of radiographs & other modern imaging techniques.
viii. Study of Histology slides.
ix. Study of embryology models
x. Audio-visual aids

Throughout the course, particular emphasis is placed on the functional correlation, clinical application & on integration with teaching in other bio dental disciplines.

d) *AN OUTLINE OF THE COURSE CONTENT:*

General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.

i. Regional anatomy of head & neck with Osteology of bones of head & neck, with emphasis on topics of dental importance.
ii. General disposition of thoracic, abdominal & pelvic organs.
iii. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
iv. General embryology & systemic embryology with respect to development of head & neck.
v. Histology of basic tissues and of the organs of gastrointestinal, respiratory, Endocrine, excretory systems & gonads.
vi. Medical genetics

e) ***THEORY: 100 HOURS***

	THEORY	
	TOPICS	**HOURS**
1	Introduction to anatomical terms, position, skin, superficial fascia and deep fascia	1
2	Simple epithelium, compound epithelium, Glandular epithelium	1
3	Scalp	1
4	Muscles of facial expression	1
5	Norma verticalis & Norma frontalis	1
6	Norma occiptalis & norma lateralis	1
7	Cervical vertebrae	1
8	Deep cervical fascia	1
9	Development of face	1
10	Brachial plexus	1
11	Classification of joints	1
12	Connective tissue	2
13	Cartilage	1
14	Bone	2
15	Muscle	1
16	Nervous tissue – Neurons, classification, regeneration, optic nerve, sciatic nerve, sensory & autonomic ganglia	2
17	Thyroid gland & development & developmental anomalies	1
18	Lymphatic drainage of head & neck.	1
19	Lacrimal apparatus & eyelid	1
20	Parotid gland & development	1
21	Dural venous sinuses – classification, cavernous sinus in detail	1
22	Pituitary gland and development & anomalies	1
23	Vascular tissue – Large artery, Medium sized artery, Large vein	1
24	Lymphatic tissue	2
25	Skin and its appendages – hair follicle – Sebaceous gland – sweat gland – nail	1
26	Anterior cranial fossa	1
27	Middle cranial fossa	1

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28	Posterior cranial fossa	1
29	Parietal bone	1
30	Occipital bone	1
31	Frontal bone	1
32	Temporal bone	2
33	Norma basalis	2
34	General embryology – oogenesis	1
35	General embryology – spermatogenesis	1
36	General embryology – fertilization	1
37	General embryology – implantation bilaminar	1
38	General embryology – bilaminar germ disc	1
39	General embryology - Neural tube formation, trilaminar germ disc, neural crest, Intraembryonic mesoderm & its fate, Notochord	2
40	General embryology - Folding of embryo	1
41	General embryology - Placenta & foetal membranes	2
42	Pharyngeal pouches & cleft	1
43	Bony orbit	1
44	Muscles of mastication	1
45	Temporomandibular joint	1
46	Hyoglossus muscle and its relations	1
47	Mandible	2
48	Maxilla	2
49	Zygomatic & hyoid bones	1
50	Pharynx	2
51	Nasal cavity & its lateral wall	1
52	Larynx	2
53	Tongue and its development & developmental anomalies	1
54	Middle ear & development	1
55	Coats of the eye – uveal tract in detail	1
56	External features of spinal cord	1
57	Leptomeninges	1
58	Blood supply of brain	1
59	Medulla oblongata– external features	1
60	Pons – external features	1

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61	Cerebellum	1
62	4th ventricle	1
63	Mid brain – external features	1
64	3rd ventricle	1
65	Cerebrum – Sulci, gyri and functional area	1
66	Lateral ventricle	1
67	Optic pathway	1
68	White matter of cerebrum and internal capsule	2
69	Basal ganglia	1
70	III Cranial Nerve & IV Cranial nerves	1
71	V Cranial nerve & VI cranial nerves	1
72	VII cranial nerve	1
73	VIII, IX cranial nerves	1
74	X, XI, XII cranial nerves	1
75	Gastrointestinal system	2
76	Respiratory system	2
77	Cardiovascular system	2
78	Excretory system	2
79	Reproductive system – male (1 hr), female (1 hr)	2
80	Medical genetics – Mitosis, Meiosis, Chromosomes and anomalies	1
81	Medical Genetics - Gene structure and genetic disorders	1
82	Medical Genetics - Mode of inheritance	1

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Sl. No.	SEMINARS
1.	Submandibular gland
2.	Nasal septum
3.	Soft palate
4.	Auditory tube
5.	Otic ganglion
6.	Pterygopalatine ganglion
7.	Submandibular ganglion
8.	Ciliary ganglion
9.	Ansa cervicalis
10.	Internal and external jugular veins
11.	Subclavian artery
12.	Autonomic nervous system
13.	Paranasal air sinuses
14.	Lingual artery
15.	Circle of Willis
16.	Choroid plexuses of the ventricles

f) PRACTICAL: 175 HOURS

Sl. No.	PRACTICALS
	HISTOLOGY
1.	Simple epithelium
2.	Compound epithelium
3.	Glandular epithelium
4.	Connective tissue
5.	Cartilage
6.	Bone
7.	Muscle
8.	Neuron – Optic Nerve - Peripheral Nerve
9.	Ganglia
10.	Blood vessels
11.	Lymphatic tissue – Lymph node, - Spleen, - Thymus - Tonsil

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12.	Skin – Thin skin, Thick skin
13.	Placenta & Umbilical cord
14.	Trachea & lung
15.	Spinal cord, Cerebellum, Cerebrum
16.	Cornea & Retina
17.	Thyroid & Parathyroid gland
18.	Suprarenal & Pituitary glands
19.	Kidney, Ureter, Urinary bladder
20.	Ovary, Corpus luteum, Testis
21.	Tongue – filiform, fungiform, circumvallate papillae
22.	Salivary glands – Mucous – Serious – Mixed
23.	Liver, Pancreas
	DISSECTION
24.	Introduction to dissection
25.	Scalp
26.	Superficial dissection of face – muscles of face
27.	Side of the neck & Posterior triangle
28.	Back of the neck – suboccipital triangle
29.	Anterior triangle
30.	Deep dissection of the neck – Thyroid gland parathyroid gland trachea, oesophagus, Brachiocephalic trunk, Subclavian artery Bracheiocephalic vein Thoracic duct. Cervical pleura Neurovascular bundle of the neck, Sympathetic chain, Scalene muscles; Cervical fascia
31.	Lymph nodes & lymph vessels of head & neck
32.	Prevertebral region – Vertebral artery – Vertebral vein
33.	Deep dissection of face – Facial artery – Other vessels - Nerves
34.	Structures in the cheek & lips
35.	Eyelid & lacrimal apparatus
36.	Parotid region
37.	Cranial cavity –meninges Dural folds, Venous sinuses
38.	Anterior cranial fossa
39.	Middle cranial fossa – Pituitary gland
40.	Posterior cranial fossa
41.	Orbit – structures in the orbit

42.	Temporal and infratemporal regions
43.	Submandibular region
44.	Mouth and pharynx
45.	Soft palate and Auditory tube
46.	Cavity of the nose
47.	Larynx
48.	Tongue
49.	Organs of hearing & equilibrium – External ear – Middle ear – Internal ear
50.	Eye ball
51.	Joints of the neck
52.	Spinal Cord
53.	Introduction to brain
54.	Meninges of brain
55.	Blood vessels of brain
56.	Base of brain
57.	Hind brain –Medulla
58.	Hind brain – Pons
59.	Hind brain – Cerebellum
60.	4th ventricle
61.	Midbrain
62.	Cerebral hemispheres
63.	White matter of cerebrum
64.	3rd ventricle
65.	Lateral ventricle
66.	Thalami – Optic tract
67.	Deep dissection of cerebral hemisphere & Internal capsule
68.	Deep nuclei and connections of thalamus
	DEMONSTRATION OF SPECIMENS
69.	Thoracic wall Chambers of heart Coronary arteries Pericardium
70.	Lungs Pleural cavity Diaphragm
71.	Abdomen –

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	Peritoneal cavity Organs in abdominal & pelvic cavities
	CLINICAL PROCEDURES
72.	Intramuscular injections Deltoid muscle Gluteal region Quadriceps femoris
73.	Intravenous injection Median cubital vein Cephalic vein Basilic vein Long saplenous vein Short saplenous vein
74.	Arterial pulsations Superficial temporal Facial Carotid Brachial Radial Femoral Dorsalis pedis Lumbar puncture

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g) *SCHEME OF EXAMINATION*

Distribution of Topics and Type of Questions for University Written examination:

Contents	Types of Questions and Marks	Marks
Questions from any topic included in the theory syllabus	Structured Essays 2x 10marks	20
Questions from any topic included in the theory syllabus Except from the topics from which the long essays have been set	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

i. Theory

University Written **70 Marks**

Internal Assessment **10 Marks**

Viva Voce: Examiner 1-Gross Anatomy-
Examiner 2-Osteology, Surface Marking & embryology } **20Marks**

ii. Practicals:

University Practical Examination: **80 Marks**

Gross Anatomy including osteology Spotters (2 mark each) *2x 15* *30 Marks*

Discussion on Dissected parts (2 Specimens) *2x15* *30 Marks*

Histology –spotters (10 slides) *2x10* *20 Marks*

Internal Assessment: **20 Marks**

Grand Total 200 Marks

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6 GENERAL MICROBIOLOGY

a) AIMS:

Introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology and the role of microbes in human diseases. The objectives of teaching microbiology can be achieved by various teaching techniques such as:

Lectures

Lecture Demonstrations

Practical exercises

Audio visual aids

Small group discussions with regular feedback from the students to be arranged.

b) OBJECTIVES:

i. Knowledge and Understanding

At the end of the Microbiology course the student is expected to:

(1) Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.

(2) Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Public Health Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.

(3) Understand and practice various methods of Sterilisation and disinfection in dental clinics.

(4) Have a sound understanding of various infectious diseases and lesions in the oral cavity.

ii. Skills

(1) Student should have acquired the skill to diagnose, differentiate various oral lesions.

(2) Should be able to select, collect and transport clinical specimens to the laboratory.

(3) Should be able to carry out proper aseptic procedures in the dental clinic.

c) COURSE CONTENT:

A brief syllabus of Microbiology is given as follows:

i. General microbiology:

(1) History, Introduction, Scope, Aims and Objectives.

(2) Morphology and Physiology of bacteria.

(3) Detail account of Sterlisation and Disinfection.

(4) Brief account of Culture media and Culture techniques.

(5) Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.

(6) Bacterial Genetics and Drug Resistance in bacteria.

ii. **Immunology:**

(1) Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.

(2) Immunity

(3) Structure and functions of Immune system

(4) The Complement System

(5) Antigen

(6) Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.

(7) Immune response

(8) Antigen - Antibody reactions - with reference to clinical utility.

(9) Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.

(10) Hypersensitivity reactions

(11) Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.

(12) Immunology of Transplantation and Malignancy

(13) Immune haematology

iii. **Systematic bacteriology:**

(1) Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus and Meningococcus - brief account of each coccus - detailed account of mode of spread laboratory diagnosis, Chemo therapy and prevention.

(2) Detailed account of Cariogenic Streptococci

(3) Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.

(4) Mycobacteria - Tuberculosis and Leprosy

(5) Clostridium - Gas gangrene, food poisoning and tetanus.

(6) Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.

(7) Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii, Actinomycetes.

iv. **Virology:**

(1) Introduction

(2) General properties, cultivation, host - virus interaction with special reference to Interferon.

(3) Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.

(4) A few viruses of relevance to dentistry.

a) Herpes Virus

b) Hepatitis B Virus - brief about other types

c) Human Immunodeficiency Virus (HIV)

d) Mumps Virus

e) Brief- Measles and Rubella Virus

(5) Bacteriophage - structure and Significance

v. **Mycology:**

(1) Brief Introduction

(2) Candidosis - in detail

(3) Briefly on oral lesions of systemic mycoses.

vi. **Parasitology:**

(1) Brief introduction - protozoans and helminthes

(2) Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

d) Theory: 65 Hours

	Topics	Hours
I.GENERALBACTERIOLOGY		
1.	Introduction, History and classification.	02
2.	Morphology, Physiology of Bacterial cell.	02
3.	Bacterial Genetics	02
4.	Infection	02
II.IMMUNOLOGY		
1.	Immunity	02
2.	Antigen	01
3.	Antibodies	01
4.	Structures and functions of Immune system	01
5.	Immune response	01
6.	Antigen and antigen reactions &compliment	04
7.	Hypersensitivity	02
8.	Autoimmunity	01

9.	Immunology of transplantation	01
III.SYSTEMATICBACTERIOLOGY		
1.	Staphylococci	01
2.	Streptococci (Dental Caries)	02
3.	Pneumococci	01
4.	Meningococci &Gonococci	01
5.	Corynebacterium diphtheria	02
6.	Bacillus	01
7.	Clostridia	02
8.	Non sporing Anaerobes	02
9.	Mycobacteria	03
10.	Spirochaetes (Treponema, leptospira and Borrelia)	03
11.	Normal bacterial flora of the Oral Cavity	01
IV.VIROLOGY		
1.	General properties of viruses	03
2.	Herpes viruses	02
3.	Measles and Mumps	01
4.	Rabies virus.	01
5.	Hepatitis viruses	02
6.	Human Immunodeficiency Virus(HIV)	01
7.	Oncogenic viruses &Poliomyelitis	02
V. PARASITOLOGY		
1.	Introduction to parasitic diseases	01
2.	Entamoeba histolytica, Malaria, Leishmania	03
VI. MYCOLOGY		
1.	Candidiasis (in detail)	02
2.	Rhinosporidiosis	02
VII.APPLIEDMICROBIOLOGY		
1.	Immunisation schedule, Collection of materials, Experimental animals &hospital infections – in brief	02

vii. Practicals/Demonstrations: 50 Hours

(I) Demonstrations:

a) Morphological forms of microbes

b) Different morphological forms of bacteria, viruses, fungi, parasites.

c) Sterilization Methods – Specified techniques – their uses.

d) Culture Media – transport media

e) Special staining techniques, stained preparations – dark ground microscopy.

f) Demonstration of bacteria in stained clinical material.

g) Demonstration of viruses – Permanent preparations morphology, inclusion bodies.

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h) Demonstration of parasite – in blood smear – in stool – in urine.

i) Demonstration of common fungi – candida – Dermatophytes.

(2) ***Practicals:***

a) Simple staining of bacteria

b) Gram's staining – isolated bacteria – Clinical materials.

c) Ziehl-Neelsen staining – prepared and fixed smears.

d) Collection of materials for culture – pus, blood.

(3) ***List of practical materials*** slides *for demonstration:*

a) Staphylococcus

b) Streptococcus

c) Gonococcus

d) Pneumococcus

e) Mycobacterium Tuberculosis

f) Mycobacterium leprae

g) Anthrax

h) Cl. Tetani

i) Spirochaetes

j) Gram Negative Bacilli

k) Candida

l) Actinomyces

(4) **Slides for practical exercises:**

a) Grams stains

(i) Staphylococci

(ii) Gram negative bacilli

(iii) Mixture of any two organisms

(iv) Gram stain of the oral cavity

b) Albertsstain–Kleb's Loffeler's Bacilli(KLB)culture, slide

c) Ziehl-Neelson'sstain -Sputum positive for AFB

(5) **Media for demonstration:**

i. Un-inoculated media:

(i) Nutrient agar plate

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(ii) Blood agar plate

(iii) Chocolate agar plate

(iv) Macconkey agar plate

(v) Glucosecitrate broth(Blood culture bottle)

(vi) Lowenstein Johnson's Mediaslope

(vii) Loefflers serum slope

(viii) Sabourauds slope

(ix) Milk agar plate

(x) Robert Cooked Meat broth

ii. Inoculated media:

(i) Nutrient agar with staphylococci

(ii) Blood Agar with Alpha Haemolytic Streptococci

(iii) Blood Agar withBeta Haemolytic Streptococci

(iv) Potassium Tellurite with growth of C.diphtheriae

(v) Milk agar with staphylococci

(vi) Antibiotic sensitivity plate

iii. Animals:

(i) Guinea pig

(ii) Rabbit

(iii) Mice

iv. Instruments:

(i) VDRL slide

(ii) Tuberculin syringe

(iii) Sterile swab

(iv) Seitz filter

(v) MacIntosh Fildes jar

(vi) Widal rack with tubes

(vii) Microtitre plate

(viii) Disposable syringe

(ix) Surgical gloves

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e) SCHEME OF EXAMINATION

i. Theory

Distribution of Topics and Type of Questions for University written examination:

Contents	Type of Questions and Marks	Marks
One Long Essay question from Systematic Bacteriology	Structured Essay 1 x 10marks	10
One question from General bacteriology One question from Immunology One question from Mycology One question from Parasitology / Oral Microbiology One question from Systematic Bacteriology	Short notes 2 x 5marks	10
One question from General bacteriology One question from Immunology One question from Systematic Bacteriology Two questions fromVirology	Brief Notes 5x3marks	15
	Total	**35**

iii. ***Theory:***

University written Examination:	**35Marks**
University Viva:	**10Marks**
Internal Assessment:	**5 Marks**
	Total: 50 Marks

iv. ***Practicals:***

Internal Assessment:	**10 Marks**
University Practicals:	**40Marks**
Total:	**50 Marks**
Grand Total	**100Marks**

Mark distribution for University practical examination

Spotters

Slides	5x 2 Marks
Media	3x2 Marks
Instruments	2x2 Marks
Gram's Stain	7 Marks
Ziehl-Neelsen's Stain	8 Marks
Practical work record	5 Marks

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16. PERIODONTOLOGY

a) *OBJECTIVES:*

The student shall acquire the skill to:-

i. Perform dental scaling diagnostic tests of periodontal diseases

ii. To use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to:-

i. Impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease

ii. Perform the treatment with full aseptic precautions

iii. Shall develop an attitude to prevent iatrogenic diseases

iv. To conserve the tooth to the maximum possible time by maintaining periodontal health

v. To refer the patients who require specialist's care.

b) *THEORY: 80 HOURS (III yr.30hrs,Final yr. Part I . 50 hrs)*

Topic	Hours
1. Introduction, Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics	1
2. Development of periodontal tissues, Micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction, periodontal ligament, Cementum, Alveolar bone	1
3. Defensive mechanisms in the oral cavity: Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment	1
4. Age changes in teeth and periodontal structures and their association with periodontal diseases and their significance in Geriatric dentistry	1
5. Classification of periodontal diseases: need for classification, Scientific basis of classification, Classification of gingival and periodontal diseases as described in World Workshopl989	1
6. Gingivitis: Plaque associated, ANUG, steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.	1
7. Periodontitis: Adult Periodontitis, rapidly progressive Periodontitis A &B, Juvenile Periodontitis (localized, generalized, and post-juvenile), Prepubertal Periodontitis, Refractory Periodontitis	1
8. Gingival diseases: Localized and generalized gingivitis, Papillary, marginal	

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and diffuse gingivitis aetiology, pathogenesis, clinical signs, symptoms and management of	
a) Plaque associated gingivitis	
b) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)	
c) ANUG	
d) Desquamative gingivitis-Gingivitis associated with Lichen Planus, Pemphigoid, Pemphigus, and other Vesiculobullous lesions	
e) Allergic gingivitis	
f) Infective gingivitis-Herpetic, Bacterial and Candidial	
g) Pericoronitis	
h) Gingival enlargement (classification and differential diagnosis)	
9. Epidemiology of periodontal diseases Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic Classification of indices (Irreversible and reversible), deficiencies of earlier indices used in Periodontics, Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN &CPL, Prevalence of periodontal diseases in India and other countries. Public health significance (All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination.)	**3**
10. Extension of inflammation from Gingiva, mechanism of spread of inflammation from gingival area to deeper periodontal structures, Factors that modify the spread	**1**
11. Pocket ,Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket	**1**
12. Etiology	**5**
a) Dental Plaque (Biofilm), Definition, New concept of Biofilm , Types, composition, bacterial colonization, growth, maturation &disclosing agents, Role of dental plaque in periodontal diseases, Plaque microorganisms in detail and bacteria associated with periodontal diseases, Plaque retentive factors, Materia alba, Food debris	
b) Calculus, Definition, Types, composition, attachment, theories of formation, Role of calculus in disease	

c) Food Impaction, Definition Types, Etiology, Hirschfield's classification, Signs, symptoms & sequelae of treatment	
d) Trauma from occlusion, Definition, Types, Histopathological changes, Role in periodontal disease, Measures of management in brief	
e) Habits, Their periodontal significance, Bruxism & Parafunctional habits, tongue thrusting, lip biting, occupational habits	
f) Iatrogenic factors,	
(i) Conservative Dentistry:-Restorations, Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth	
(ii) Prosthodontics, Interrelationship, Bridges and other prosthesis, Pontics (types), surface contour, relationships of margins to the periodontium, gingival protection theory, muscle action theory& theory of access to oral hygiene.	4
(iii) Orthodontics, Interrelationship, removable appliances & fixed appliances, Retention of plaque, bacterial changes	
g) Systemic diseases, Diabetes, Sex hormones, nutrition (Vit.C& proteins),AIDS & periodontium, Hemorrhagic diseases, Leukemia, clotting factor disorders, PMN 1disorder	1
13. Risk factors, Definition, Risk factors for periodontal diseases	1
14. Host response: Mechanism of initiation and progression of periodontal diseases, Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief, Stages in gingivitis-Initial, early, established & advanced, Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	2
15. Periodontitis:	
a) Etiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult Periodontitis	
b) Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment	5
c) Furcation involvement, Glickman's classification, prognosis and	

management	
d) Rapidly progressive Periodontitis Juvenile Periodontitis: Localized and generalized Post juvenile Periodontitis	
e) Periodontitis associated with systemic diseases ,Refractory Periodontitis	
16. Diagnosis:	
a) Routine procedures, methods of probing, 2 types of probes, (According to case history)	**3**
b) Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	
17. Prognosis, Definition, types, purpose and factors to be taken into consideration	**1**
18. Treatment plan Factors to be considered	**1**
19. Periodontal therapy	
a) General principles of periodontal therapy. Phase I, II, III, IV therapy.	
b) Definition of periodontal regeneration, repair, new attachment and reattachment	
c) Plaque control	**5**
(i) mechanical :tooth brushes, Interdental cleaning aids, dentifrices	
(ii) Chemical: classification and mechanism of action of each & pocket irrigation	
20. Pocket eradication procedures	
a) Scaling and root planning: Indications, Aims & objectives, Healing following root planning, Hand instruments, sonic, ultrasonic & Piezo-electric Scalers	
b) Curettage: Definition Indications present concepts Aims &objectives, Procedures & healing response	**5**
c) Flap surgery: Definition, Types of flaps, Design of flaps, papilla preservation Indications & contraindications, Armamentarium, Surgical procedure & healing response	
21. Osseous Surgery:	
a) Osseous defects in periodontal disease, Definition, Classification	**5**
b) Surgery: resective, additive osseous surgery, osseous grafts with	

classification of grafts)	
c) Healing responses	
d) Other regenerative procedures; root conditioning	
e) Guided tissue regeneration	
22. Mucogingival surgery & periodontal plastic surgery:	**5**
a) Definition, Mucogingival problems: etiology,	
b) classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins), Indications, objectives	
c) Gingival Augmentation procedures apical and coronal to recession : d) Frenectomy, Frenotomy	
e) Crown lengthening procedures	
f) Periodontal microsurgery in brief	
g) Splints: Periodontal splints, Purpose & classification, Principles of splinting	**1**
h) Hypersensitivity, Cause, theories & Management	**1**
i) Implants: Definition, types, scope & biomaterials used, Periodontal considerations: such as Implant-bone interface, Implant-Gingiva interface, Implant failure, Peri-implantitis &management	**1**
23. Maintenance phase (SPT):	**4**
a. Causes, Theories & management	
b. Aims, objectives, and principles	
c. Importance	
d. Procedures	
e. Maintenance of implants	
24. Pharmacotherapy:	**4**
a. Periodontal dressings	
b. Antibiotics & anti-inflammatory drugs	
c. Local drug delivery systems	
25. Periodontal management of medically compromised patients: Topics concerning periodontal management of medically compromised patients	**2**
26. Inter-disciplinary care: Pulpo-Periodontal involvement, Routes of spread of infection, Simons classification, Management	**1**
27. Systemic effects of periodontal diseases in brief: Cardiovascular diseases;	**1**

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Low birth weight babies etc.	
28. Infection control protocol: Sterilization and various aseptic procedures	**1**
29. Ethics.	**1**

c) TUTORIALS DURING CLINICAL POSTING:

i. Infection control
ii. Periodontal instruments
iii. Chair position and principles of instrumentation
iv. Maintenance of instruments (sharpening)
v. Ultrasonic, Piezoelectric and sonic scaling - demonstration of technique
vi. Diagnosis of periodontal disease and determination of prognosis
vii. Radiographic interpretation and lab investigations
viii. Motivation of patients- oral hygiene instructions
ix. Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment.
x. Student should perform scaling, root plaining local drug delivery and SPT.
xi. Shall be given demonstration of all periodontal surgical procedures.

d) DEMONSTRATIONS:

i. History taking and clinical examination of the patients
ii. Recording different indices
iii. Methods of using various scaling and surgical instruments
iv. Polishing the teeth
v. Bacterial smear taking
vi. Demonstration to patients about different oral hygiene aids
vii. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
viii. Follow up procedures, post operative care and supervision

e) MINIMUM CLINICAL REQUIREMENTS MANDATORY TO APPEAR FOR UNIVERSITY EXAMINATION:

i. Diagnosis, treatment planning, and discussion and total periodontal treatment- 10 cases (5 Long cases + 5 Short Cases)
ii. Supra gingival scaling 50 complete cases (including minimum 2 ultrasonic scaling) and oral hygiene instructions –
iii. Sub gingival Scaling and Root Plaining - 10 cases

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iv. Assistance in periodontal surgery- 2 cases

v. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

vi. Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Periodontology Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

v. Theory

University Written	**70 Marks**
Viva Voce	**20 Marks**
Internal Assessment	**10 Marks**

vi. Clinical:

University Clinical Examination:	**80 Marks**
Case History, Clinical Examination, Diagnosis & Treatment Planning	30*Marks*
Oral prophylaxis	30 Marks
Clinical Work Record & Seminar	20 *Marks*
Internal Assessment:	**20 Marks**

Grand Total 200Marks

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2. GENERAL HUMAN PHYSIOLOGY

a) GOAL

The broad goal of the teaching undergraduate students in Physiology aims at providing the student 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.

b) OBJECTIVES

i. 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 interactions for well co-ordinated 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.

ii. 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.

iii. Integration

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

c) THEORY: 120 Hours

	Hours
1. GENERAL PHYSIOLOGY	
Homeostasis: Basic concept, Feedback mechanisms Structure of cell membrane, transport across cell membrane Body fluid Compartments: distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid. Membrane potentials. RMP & Action Potential.	4
2. BLOOD:	15
Composition & functions of blood,	

Plasma proteins - Types, concentration, functions & variations, Erythrocyte: Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis, ESR- factors affecting, variations & significance. Haemoglobin - Normal concentration, method of determination [P] & variation in concentration, functions Anaemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigments, Jaundice - types. Leucocytes: Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity, life span & fate of leucocytes. [Mention Leukemia] Thromobocytes - Morphology, number, variations, function. Haemostatsis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction. Fibrinolytic system. Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action. Bleeding disorders. Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.[mention only] Blood volume: Normal values, variations. Functions of reticulo-endothelial system. Specific gravity, Packed cell volume, Methods of estimation [in practicals] Blood Indices - MCV, MCH, MCHC - definition, normal values, variation. Leucopoiesis Thrombopoiesis.	
3.MUSCLE AND NERVE	
Classification of nerves, Structure of skeletal muscle - Molecular mechanism of muscle contraction, Neuromuscular junction and NM transmission.	8

Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.	
4. DIGESTIVE SYSTEM :	
Introduction to digestion: General structure of G.I. tract, Innervation. Salivary glands: Saliva: composition, regulation of secretion & functions of saliva. Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion. HCl secretion. Physiological basis of Peptic ulcer management [briefly] Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion. Liver : structure , composition of bile, functions of bile Gall bladder: structure, functions. Small intestine - Composition, functions Large intestine - Functions. Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.	10
5. EXCRETORY SYSTEM :	
Structure & functions of kidney, functional unit of kidney & functions of different parts. Juxta Glomerular apparatus. Special functional features of renal circulation. Formation of Urine: Glomerular filtration rate - definition, normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances. Tubular secretion - secretion of urea, hydrogen and other substances. Countercurrent mechanisms. Micturition: anatomy & innervation of Urinary bladder, mechanism of micturition. Determination of GFR. Role of kidney in the regulation of pH of the blood. Urinary bladder: abnormalities.	8
6. SKIN AND TEMPERATURE REGULATION [basics only]	4
7. ENDOCRINOLOGY	14
General endocrinology- endocrine glands & hormones. Second messengers.	

Endocrine function of hypothalamus. Hormones of anterior pituitary & their actions, Disorders of secretion of anterior pituitary hormones. Posterior pituitary hormones: actions Thyroid: secretion & transport of hormones, actions of hormones, regulation. Adrenal cortex & Medulla- action, Other hormones - Angiotensin, local hormones Pancreatic Hormone PTH Endocrine Disorders to be taught with each gland.	
8. REPRODUCTION	
Physiological anatomy of male and female sex organs, Gonadotropic hormones. Sex chromatin. Female reproductive system: Menstrual cycle, functions and hormones of ovary. Ovarian and uterine changes during menstrual cycle. Actions of oestrogen &Progesterone control of secretion of ovarian hormones, fertilization, implantation, maternal changes during pregnancy and parturition. Lactation, milk ejection reflex. Male reproductive system, spermatogenesis, hormones-testosterone. Semen. Contraception.	6
9. CARDIO VASCULAR SYSTEM	
Functional anatomy and innervation of heart. Properties of cardiac muscle. Origin & propagation of cardiac impulse and Pacemaker potential. Action potential. Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta. Volume changes in ventricles. Heart sounds. Jugular venous pulse Arterial pulse. Electrocardiogram- Basic principles only. Normal electrocardiogram. Heart rate: Normal value, variation. Stroke volume and Cardiac output: definition, normal values, variations, factors affecting. Arterial blood pressure: Definition, normal values, variations, determinants. Regulation of heart rate, stroke volume, blood pressure: integrated concept.	15

Coronary circulation: special features. Cardiac murmurs Cardiac output: one method of determination Cardio vascular homeostasis in exercise & posture.	
10. RESPIRATORY SYSTEM	
Physiology of Respiration: External & internal respiration. Functional anatomy of respiratory passage & lungs. Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs. Intra pleural & intra pulmonary pressures & their changes during the phases of respiration. Mechanics of breathing - surfactant, compliance & work of breathing [basics only]. Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, Pulmonary ventilation- alveolar ventilation & dead space-ventilation. Pulmonary circulation: Functional features. Composition of inspired air, alveolar air and expired air. Exchange of gases: Diffusing capacity, factors affecting it. Transport of Oxygen & carbon dioxide in the blood. Regulation of respiration- neural & chemical. Hypoxia, cyanosis, dyspnoea, periodic breathing. Artificial respiration. FEV & its variations. Pulmonary function tests Respiratory changes during exercise	12
11. CENTRAL NERVOUS SYSTEM	
Organisation of central nervous system Neuronal organisation at spinal cord level, Synapse: functional significance. Receptors, reflexes, sensations and sensory tracts, motor system Physiology of pain. Referred pain. Analgesia systems. Functions of thalamus, cerebellum. Vestibular apparatus [basics only] Cerebral cortex: Basics of higher functions. Formation and functions of CSF: clinical significance. Autonomic nervous system	10

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12. SPECIAL SENSES	
Fundamental knowledge of vision, hearing, taste and smell. Errors of refraction. Tests of auditory function	14

d) PRACTICALS

The following list of practical is minimum and essential. The entire 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 shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

Practicals & demonstrations: 60 hours

Practicals	Hours
Study of Microscope and its uses	02
Collection of blood and study of haemocytometer	02
Haemoglobinometry	02
Determination of RB count	08
Determination of WBC count	04
Determination of blood groups	02
Leishman's staining and differential leucocyte count	10
Calculation of blood indices	02
Determination of bleeding time	01
Determination of clotting time	01
Blood pressure recording	03
Auscultation of Heart sounds	02
Demonstrations	
Determination of Erythrocyte Sedimentation rate(ESR)	02
Determination of packed cell volume(PCV)	02
Determination of specific gravity of blood	02
Fragility test for RBC	02
Clinical examination of Cardiovascular and Respiratory System	03
Determination of vital capacity	02
Artificial respiration	02
Demonstration of deep and superficial reflexes	02
Activity of frog's heart and effects of Acetylcholine, Atropine and	02
Electrocardiography: Demonstration of recording of normal Electro	02
Total	60

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e) SCHEME OF EXAMINATION

Types of Questions for written examination

Type of Questions	Marks
Structured Essays 1x 10 marks	10
Short Notes 2 x 5 marks	10
Brief Notes 5 x 3 marks	15
Total	35

i. *Theory:*

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination

Major Experiments: **20Marks**

Any one of the Major Experiments: R.B.C. Count, W.B.C. Count, Differential Count, Blood Pressure Recording

Minor Experiments: **15Marks**

Any one of the minor Experiments: Determination of Blood Groups, Determination of Bleeding & Clotting time, Haemoglobin Estimation, Calculation of absolute Hematological Indices–MCH, MCV, MCHC

Practical Work record: **5 Marks**

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3. BIOCHEMISTRY, NUTRITION AND DIETETICS

a) AIMS AND SCOPE

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 organise macromolecules. Details on structure need not be emphasised.

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 memorise 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 aspects 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.

b) THEORY: 70 HOURS

No.	TOPIC	HOURS ALLOTTED
1	**CARBOHYDRATES**	**12 hours**
	Definition, biological importance and classification. Monosaccharide's –Glucose, fructose, galactose, mannose	1
	Reactions: reducing property, oxidation, osazone, Molisch test. Define anomerism, epimerism with examples.	1
	Disaccharides-lactose, maltose, sucrose, Glycosidic bond, amino sugars, deoxy sugars	1
	Polysaccharides. Structures of starch and glycogen, Mucopolysaccharides (definition, name, components) biochemical	1

	significance. *nature of linkages not required*) Dietary fibers.	
	Digestion and absorption of carbohydrates. associated disorders(in brief)	1
	Glycolysis, fates of pyruvate Gluconeogenesis.	2
	Glycogenesis, glycogenolysis,	2
	Significance of pentose phosphate pathway. Importance of glucuronic acid.	1
	Regulation of blood glucose. Diabetes mellitus: impaired fasting glucose, impaired glucose tolerance, gestational diabetes mellitus. Evaluation of glycemic status.	2
2	**LIPIDS**	**9 hours**
	Definition, biological importance and classification. Fats and fatty acids. Essential fatty acids. Introduction to compound lipids. Cholesterol.	2
	Digestion and absorption of lipids	1
	Beta oxidation of fatty acids	1
	Fatty acid synthesis, (in brief)	1
	Ketone body formation and utilization	1
	Outlines of cholesterol synthesis and compounds formed from cholesterol	1
	Plasma lipoproteins: Formation, function and dyslipidemia, Atherosclerosis.	2
3	**ENZYMES**	**6 hours**
	Definition, classification, specificity and active site. Cofactors.	1
	Factors affecting enzyme action	2
	Enzyme inhibition	2
	Clinical important enzymes- AST,ALT,ALP,PSA,LDH,CK,G6PD,GGT	1
4	**PROTEINS**	**9hours**
	Amino acids: Classification. Introduction to peptides, peptide bond Proteins: Classification. Charge properties. Buffer action. Levels of protein organization Denaturation.	3
	Digestion and absorption of proteins. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for	2

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	evaluation of protein quality to be excluded). Protein-calorie malnutrition, Balanced diet.(*in brief*)	
	Formation of Ammonia and Urea cycle.	1
	Reactions of amino acids-transamination, trans methylation, trans sulfuration (*in brief*)	1
	Compounds formed from glycine	1
	Biologic importance of aromatic amino acids, sulphur containing amino acids, Aminoacidurias (in brief)	1
5	**INTEGRATION OF METABOLISM** High energy compounds, Electron transport chain and oxidative phosphorylation.	**2hours**
6	**VITAMINS**	**5 hours**
	Fat soluble vitamins A,D,E,K, sources, functions, daily requirements, deficiency, Toxicity	2
	Water soluble vitamins B, C, sources, functions, daily requirements, deficiency, Toxicity	3
7	**ACID BASE BALANCE** Buffers, respiratory and renal regulation, disorders, analysis	**4hours**
8	**MINERALS**	**6hours**
	Classification, daily requirement. Calcium and phosphorous: sources, uptake, excretion, function. Serum calcium regulation.	2
	Iron: sources, uptake and transport. Heme and nonheme iron functions; deficiency	2
	Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess	1
	Indications of role of other minerals	1
9	**HAEMOGLOBIN**	**3 hours**
	Structure, synthesis, degradation	1
	Hemoglobinopathies	1
	Jaundice	
10	**PLASMA PROTEINS** Classification and separation. Functions of albumin.	**2 hours**

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	immunoglobulins. Biochemistry of AIDS.	
11	**LIVER FUNCTION TESTS**	**1 hours**
12	**KIDNEY FUNCTION TESTS**	**1 hours**
13	**MOLECULAR BIOLOGY**	**8 hours**
	Nucleic acids: Building units. Nucleotides. Outline structure of DNA and RNA.	2
	Formation and degradation of nucleotides. (*in brief*) Gout. Lesch-nyhan syndrome	2
	Replication. Transcription. (*in brief*) Antimetabolites and antibiotics interfering in replication, transcription	2
	Outline of translation process.	2
14	**Techniques-colorimetry, ELISA, RIA**	**2 hours**

c) PRACTICALS,DEMONSTRATION& SEMINAR: 60 hours

i. Practical: 45 hours

Sl.No.	Procedure	Hours
1.	Introduction to lab procedures	1
2.	Normal & abnormal constituents of urine	12
3.	Introduction to clinical chemistry	2
4.	Estimation of blood urea	2
5.	Estimation of serum protein	2
6.	Estimation of blood sugar	2
7.	Estimation of serum creatinine	2
8	Estimation of serum albumin	2

ii. Demonstration: 20 hours

Sl.No.	Procedure	Hours
1.	Electrophoresis	2
2.	Chromatography	2
3.	GTT charts	2
4.	LFT charts	2
5.	Revision	

iii. Seminars: 15 hours

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d) SCHEMEOF EXAMINATION

Types of Questions for written examination

Type of Questions	Marks
Structured Essays 1x 10 marks	10
Short Notes 2 x 5 marks	10
Brief Notes 5 x 3 marks	15
Total	**35**

i. *Theory:*

University written Examination: 35Marks
University Viva: 10Marks
Internal Assessment: 5 Marks
Total: 50 Marks

ii. *Practicals:*

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination;

One procedure for quantitative estimation	15marks
One procedure for qualitative analysis	20marks
Practical Work record:	5 Marks

The following Procedures are suggested for University Practical Examination:

Quantitative Estimation (Any ONE estimation to be done)

Estimation of blood sugar/serum creatinine/blood urea/serum protein/serum albumin

Qualitative Analysis (Any ONE analysis to be done)

Urine Analysis–normal constituents

Report of abnormal urine

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4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY.

a) *INTRODUCTION:*

The course includes instructions in the subject of Dental Morphology, Oral Embryology, Oral Histology and Oral Physiology. A composite study of basic Dental Sciences & their clinical applications.

b) *SKILLS*

The student should acquire basic skills in:

i. Carving of crowns of permanent teeth in wax.
ii. Microscopic study of Oral tissues.
iii. Identification of Deciduous & Permanent teeth
iv. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

c) *OBJECTIVES*

After a course on Oral Biology,

i. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
ii. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
iii. The students must know the basic knowledge of various research methodologies

d) *COURSE CONTENT*

i. Theory: 105 hours

DENTAL ANATOMY	HOURS
1. Introduction, Dental Anthropology & Comparative Dental Anatomy	3
2. Function of teeth.	
3. Nomenclature.	
4. Tooth numbering systems (Different system)(Dental formula).	
5. Chronology of deciduous and permanent teeth. (First evidence of calcification, crown completion, eruption and root completion).	2
6. Deciduous teeth - a) Nomenclature. b) Importance of deciduous teeth. c) Form & function, comparative dental anatomy, fundamental curvature	4
7. Gross morphology of deciduous teeth.	5
8. General differences between deciduous and permanent teeth.	1
9. Morphology of permanent teeth. Chronology, measurements, description of individual surface and	12

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variations of each tooth.	
10. Morphological differences between incisors, premolars and molars of same arch.	1
11. Morphological differences between maxillary and mandibular. incisors, canines, premolars and molars of the opposite arch	1
12. Internal Anatomy of Pulp.	1
13. Occlusion: a. Development of occlusion. b. Dental arch form. c. Compensating curves of dental arches. d. Angulations of individual teeth in relation to various planes. e. Functional form of the teeth at their incisal and occlusal thirds. f. Facial relations of each tooth in one arch to its antagonist or antagonists in the opposing arch in centric occlusion. g. Occlusal contact and interscusp relations of all the teeth of one arch with those in the opposing arch in centric occlusion. h. Occlusal contact and intercusp relations of all the teeth during the various functional mandibular movements. i. Neurobehavioral aspect of occlusion	8
14. Temporo Mandibular Joint (T.M.J.): Gross Anatomy and articulation.Muscles (Muscles of mastication). Mandibular position and movements.Histology. Clinical considerations with special emphasis on Myofacial Pain Dysfunction Syndrome (MPDS) - (Desirable to Know)	2
ORAL PHYSIOLOGY	
1. Theories of calcification	1
2. Mastication and deglutition	1
Oral Embryology, Anatomy and Histology:	
1. Development and growth of face and jaws.	1
2. Development of tooth.	3
3. Cranial nerves with more emphasis on V.VII and IX.	1
4. Blood supply, nerve supply and lymphatic drainage of teeth and surrounding structures	
5. Cell - structure and function	1

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6. Maxillary sinus - Structure, Variations, Histology function and clinical considerations	2
7. Salivary Glands - Classification, structure, function, Histology, Clinical Considerations and age changes.	4
8. Oral Mucous membrane: Definitions, General consideration. Functions and classifications. Structure and microscopic appearance of gingiva, palate, lips, alveolar mucosa, tongue, floor of mouth. Gingival sulcus and dentogingival junction. Clinical considerations and age changes.	8
9.ENAMEL: Physical characteristics, chemical properties structure. Development - Life cycle of ameloblasts, Amelogenesis and Mineralisation. Clinical considerations. Age changes.	8
10.DENTIN: Physical characteristics, chemical properties, structure. Types of dentin. Dentin innervation and hypersensitivity. Development - Dentinogenesis and mineralisation. Clinical considerations. Age Changes.	6
11.PULP: Anatomy, structural features, functions, pulp organs. Developments. Clinical consideration Age changes.	6
12.CEMENIUM: Physical characteristics, chemical properties, structure. Cementogenesis. Clinical consideration Age changes.	4
13.PERIODONTAL LIGAMENT: Cells and fibers, Functions, Development, Clinical Considerations., Age Changes	5
14.ALVEOLAR BONE: Physical characteristics, chemical properties structure. Structure, Development., Internal reconstruction, Clinical consideration.	5
Tissue processing & Histochemistry	4
THEORIES OF ERUPTION AND SHEDDING. (Physiological tooth movement)	4

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ii. ***Practical: 250 Hours***

DENTAL ANATOMY:
Carving on wax blocks:-
a. Individual tooth - Only permanent teeth of both arches.
- Central, Incisors, Lateral, Canines, Premolars and 1st and 2nd molars
HISTOLOGY:
List of Histology slides:
Development of tooth:
01. Bud stage of tooth development.
02. Cap stage of tooth development.
03. Early bell stage of tooth development.
04. Late Bell stage of tooth development.
05. Root formation.
ENAMEL:
01. Enamel rod.
02. Hunter-Schreger Bands
03. Tufts, Lamellae, Spindles.
04. Incremental lines of Retzius.
05. Neonatal line.
06. Gnarled Enamel.
DENTIN:
01. Dentino - Enamel junction.
02. Dentinal Tubules.
03. Incremental lines of Von Ebner.
04. Contour lines of Owen.
05. Neonatal line.
06. Tomes granular layer.
07. Interglobular Dentin.
08. Secondary Dentin.
09. Intratubular Dentin.
10. Intertubular Dentin.
CEMENTUM:
01. Cellular cementum.

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02. Acellular cementum.

03. Cemento enamel junction

- Type 1 - 60% type - Overlapping.

- Type 2 - 30% type - Butt

- Type 3 - 10% type - Cementum & Enamel do not meet.

04. Sharpey's fibers.

05. Hypercementosis.

PULP:

01. Zones of Pulp.

02. Pulp stones.

PERIODONTAL LIGAMENT:

01. Principle fibers of Periodontal ligament

- Apical, Horizontal, Oblique, Alveolar crest, Interradicular, Transeptal

ALVEOLAR BONE:

01. Haversian system.

02. Trabeculated bone.

03. Mature and immature bone.

SALIVARY GLANDS:

01. Mucous gland.

02. Serous gland.

03. Mixed gland.

MAXILLARY SINUS:

Sinus lining (Pseudostratified ciliated columnar)
(Desirable to know)

ORAL MUCOUS MEMBRAIN:

01. Parakeratinised epithelium.

02. Orthokeratinised epithelium.

03. Palate - Anterolateral zone.

04. Palate - Posterolateral zone.

05. Alveolar mucosa.

06. Vermilion border of lip.

07. Tongue - Circumvallate Papillae.
- Fungiform Papillae
- Filiform Papillae

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Preparation of Ground sections, haematoxylin & Eosin sections & decalcified section

iii. Lecture demonstration:

Identification of Individual teeth

(1) Deciduous

(2) Permanent

(3) Mixed dentition using study models

(4) Demonstration of preparation of ground section, Decalcification, Paraffin section and H & E Staining.

e) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University written examination

Contents	Type of Questions and Marks	Marks
Dental anatomy - one question - 14 marks Detailed morphology of Permanent teeth, Differences between Primary & Permanent teeth, Occlusion and Arrangement of teeth. **B. Oral histology - one question - 14 marks** Development of tooth, Enamel-structure & development, Dentin-structure& development, Cementum, Dental pulp-structure & histology, Periodontal ligament, Alveolar bone-structure & histology, Oral mucosa-structure & histology, Eruption of teeth	Structured Essays 2x 10marks	• 20
A. Oral histology - two questions - 16 marks B. Dental anatomy - one question - 08 marks C. Oral physiology - one question - 08 marks	Short notes 4 x 5marks	20
A. Oral histology - five questions - 20 marks B. Dental anatomy - three question - 12 marks C. Oral physiology - one question - 04 marks D. Oral embryology - one question - 04 marks	Brief Notes 10x3marks	30
	Total	**70**

i. **Theory**

University written Examination: **70Marks**

University Viva: **20Marks**

Internal Assessment: **10 Marks**

ii. **Practicals:**

Internal Assessment: **20 Marks**

University Practicals: **80Marks**

Grand Total **200 Marks**

Mark Distribution for University Practical Examination:

Tooth Carving: (Time allotted 75 Minutes) 25 Marks

Spotters: (15X3 marks) 45 Marks

Practical work Record: 10 marks

Type of Spotters:

8 Histology and Ground Section slides

5 Tooth identification

2 Casts for identification of teeth, numbering system and age assessment

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5. GENERAL PATHOLOGY

a) *AIM:*

At the end of the course the student should be competent to: Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

b) *OBJECTIVES:*

Enabling the student

i. To demonstrate and analyze pathological changes macroscopically explain their observations in terms of disease processes.

ii. To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.

iii. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.

iv. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

c) *COURSE CONTENT:*

i. **Theory: 55Hours**

Sl. No.	TOPIC	HOURS ALLOTTED
1	Introduction , Terminologies, The cell in health, The normal cell structure, The cellular functions	1
2	Etiology and Pathogenesis of disease, Cell Injury Types - congenital, Acquired Mainly Acquired causes (Hypoxic injury, chemical injury, physical injury, immunological injury) Cell death& Necrosis Apoptosis, definition, causes, features and types of necrosis Gangrene - Dry, wet, gas Pathological Calcifications (Dystrophic and metastatic)	3
3	Degenerations, Amyloidosis, Fatty change, Cloudy swelling, Hyaline change, mucoid degeneration	2
4	Inflammation, Definition, causes types, and features, Acute inflammation, The vascular response, The cellular response, Chemical mediators, The inflammatory cells Fate, Chronic inflammation, Granulomatous inflammation	3

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5	Healing Regeneration, Repair Mechanisms, Healing by primary intention, Healing by secondary intention, Fracture healing, Factors influencing healing process, Complications	3
6	Immunological mechanisms in disease Humoral & cellular immunity Hypersensitivity & autoimmunity	2
7	Infections & infestations (1) Syphilis: Epidemiology, Types and stages of syphilis, Pathological, features, Diagnostic criteria, Oral lesions (2) Typhoid, Epidemiology, Pathogenesis, Pathological features, Diagnostic criteria, Thrombosis (3) Tuberculosis, Epidemiology, Pathogenesis, (Formation of tubercle), Pathological, features of Primary and secondary TB, Complications and Fate (4) AIDS & Hepatitis (5) Actinomycosis (6) Candidiasis (7) Mucormycosis (8) Pyogenic infections	6
8	(1) Disorders of circulation, Hyperemia, Shock (2) Definition, Pathophysiology, Formation, complications & Fate of a thrombus (3) Embolism, Definition, Types, Effects (4) Ischemia and Infarction, Definition, etiology, types, Infraction of various organs (5) Derangements of body fluids, Oedema - Pathogenesis, Different types	4
9	Nutritional Disorders, starvation, obesity, malnutrition, pathogenesis of deficiency diseases with special reference to disorders of vitamins & minerals	3
10	Diabetes Mellitus, Definition, Classification, Pathogenesis, Pathology in different organs	2
11	Hypertension, Definition, classification, Pathophysiology, Effects in various organs	2
12	Brief introduction to growth & differentiation Adaptive disorders of	1

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	growth, Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia	
13	General Aspects of neoplasia, Definition, terminology, classification, Differences between benign and malignant neoplasms, The neoplastic cell, Metastasis, Etiology and pathogenesis of neoplasia, Carcinogenesis, Tumour biology, Oncogene and anti-oncogenes, Diagnosis, Precancerous lesions, Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenocarcinoma, Fibroma & Fibrosarcoma, Lipoma and liposarcoma	4
14	Common diseases of Bones, Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurismal bone cyst	3
15	Diseases of oral cavity, Lichen planus, Stomatitis, Leukoplakia, Squamous cell Ca, Dental caries, Dentigerious cyst, Ameloblastoma Diseases of salivary glands, Normal structure, Sialadenitis & Tumours	4
16	Diseases of Cardiovascular system Cardiac failure, Congenital heart disease ASD, VSD, PDA, Fallot's Tetrology, Infective Endocarditis, Atherosclerosis, Ischaemic heart Disease	2
17	Introduction to haematology , haemopoiesis, bone marrow aspiration & biopsy, Anaemias, classification, Iron Deficiency anaemia, Megaloblastic anaemia, hemolytic anaemeas and their lab investigations, Polycythemea.	3
18	Haemorrhagic Disorders, Coagulation cascade Coagulation disorders Platelet function, Platelet disorders	3
19	Diseases of WBC's pathologic variations in white blood cell counts and leukemoid reactions, Leukaemias, Acute and chronic leukaemias, Diagnosis and clinical features Diseases of Lymph nodes, Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma	4

ii. Practicals and lecture demonstrations: 55 hours

(1) Lecture demonstrations: 10 Hours

a) Anti coagulants, Blood indices

b) PCV & ESR

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c) Instruments & their uses:

(i) Neubauer's Counting chamber

(ii) Haemoglobinometer

(iii) W.B.C Pipette

(iv) Wintrobe Tube

(v) Urinometer

d) Cytologic Techniques- FNAC and buccal smear

e) Study of anaemeas- Microcytic, Macrocytic and Dimorphic blood picture

f) Study of Acute leukemias- Any one type

g) Study of Chronic Leukemias- Any one type

(2) Histopathology Slides & Specimens: 20 Hours

a) Tissue Processing, Staining

b) Histopathology slides

(i) Acute appendicitis,

(ii) Granulation tissue,

(iii) fatty liver

(iv) CVC lung, CVC liver, CVC spleen

(v) Kidney amyloidosis

(vi) Tuberculosis,

(vii) Actionomycosis,

(viii) Rhinosporidiosis

(ix) Squamous cell papilloma,

(x) Transitional cell papilloma,

(xi) Pleomorphic adenoma

(xii) Basal cell carcinomas

(xiii) Sqamous cell carcinoma

(xiv) Osteosarcoma,

(xv) osteoclastoma,

(xvi) fibrosarcoma

(xvii) Malignant melanoma,

(xviii) Ameloblastoma,

(xix) Adenocarcinoma

(xx) Pleomorphic adenoma

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(xxi) Metastatic carcinoma in lymph node

(xxii) Capillary and cavernous haemangioma

(xxiii) Fibroma

(xxiv) Neurofibroma

(xxv) Lipoma

(xxvi) Osteoma, chondroma

c) Specimens

(i) Acute Appendicitis.

(ii) Tuberculosis Lymphnode.

(iii) Fatty liver.

(iv) Infarction spleen.

(v) Chronic Venous Congestion (C.V.C.) Liver

(vi) Squamous papilloma

(vii) Basal cell carcinoma

(viii) Lipoma

(ix) Squamous cell carcinoma

(x) Malignant Melanoma

(xi) Adenocarcinoma

(xii) Osteosarcoma

(xiii) Osteoclastoma.

(xiv) Gangrene.

(3) **Practicals that must be done by the students: 25hrs.**

(i) Determination of Haemoglobin percentage

(ii) Blood grouping.

(iii) Total Leukocytecount

(iv) Bleeding time , Clotting time

(v) Peripheral blood smear staining and study

(vi) Differential leukocyte count.

(vii) Urine examination- for sugar, ketone bodies, protein, blood, bile pigments and bile salts- any one standard test

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d) SCHEME OF EXAMINATION

i. Theory:

Distribution of Topics and Type of Questions for written examination

Contents	Types of Questions and Marks	Marks
Question from General Pathology Inflammation, Healing and Repair, Tuberculosis, Leprosy, Syphilis, Thrombosis, Neoplasia, Diseases of bone, Cell injury, metabolic disturbances, Circulatory disturbances, Hypertension, diseases of oral cavity	Structured Essay 1x 10marks	10
Two questions from General Pathology Intracellular accumulations, Necrosis, Gangrene, Apoptosis, Amyloidosis, Pathologic calcification, hypersensitivity reactions, Infections, Shock, Oedema, Infarction, Congestion, Hypertension, Diabetes Mellitus, Premalignant Conditions, Neoplasia, Osteomyelitis, Anaemias, Neoplastic Proliferation of WBCs–Leukaemias and Lymphomas, Haemorrhagic disorders, Erythrocyte Sedimentation Rate(ESR),Urine sediment. Two from Haematology One from Clinical Pathology	Short Notes 2 x 5marks Brief notes 5 x 3	10 15
	Total	**35**

i. *Theory:*

University written Examination:	**35Marks**
University Viva:	**10Marks**
Internal Assessment:	**5 Marks**
	Total: 50 Marks

ii. *Practicals:*

Internal Assessment:	**10 Marks**
University Practicals:	**40Marks**
Total:	**50 Marks**
	Grand Total 100Marks

Mark distribution for University practical examination

Spotters

Haematology slide	2x 2marks
Histopathology slides	5x2marks
Specimens	2x2marks
Instruments	1x2marks

Any three of the following exercises to be evaluated:

To examine given sample of urine for abnormal constituents
To do differential count on the given peripheral blood smear
To estimate haemoglobin percentage in the given sample of blood
To determine blood groups (ABO and Rh) in the given sample of blood

3x 5 marks

Practical work record 5marks

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6 GENERAL MICROBIOLOGY

a) AIMS:

Introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology and the role of microbes in human diseases. The objectives of teaching microbiology can be achieved by various teaching techniques such as:

Lectures

Lecture Demonstrations

Practical exercises

Audio visual aids

Small group discussions with regular feedback from the students to be arranged.

b) OBJECTIVES:

i. Knowledge and Understanding

At the end of the Microbiology course the student is expected to:

(1) Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.

(2) Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Public Health Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.

(3) Understand and practice various methods of Sterilisation and disinfection in dental clinics.

(4) Have a sound understanding of various infectious diseases and lesions in the oral cavity.

ii. Skills

(1) Student should have acquired the skill to diagnose, differentiate various oral lesions.

(2) Should be able to select, collect and transport clinical specimens to the laboratory.

(3) Should be able to carry out proper aseptic procedures in the dental clinic.

c) COURSE CONTENT:

A brief syllabus of Microbiology is given as follows:

i. General microbiology:

(1) History, Introduction, Scope, Aims and Objectives.

(2) Morphology and Physiology of bacteria.

(3) Detail account of Sterlisation and Disinfection.

(4) Brief account of Culture media and Culture techniques.

(5) Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.

(6) Bacterial Genetics and Drug Resistance in bacteria.

ii. Immunology:

(1) Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.

(2) Immunity

(3) Structure and functions of Immune system

(4) The Complement System

(5) Antigen

(6) Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.

(7) Immune response

(8) Antigen - Antibody reactions - with reference to clinical utility.

(9) Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.

(10) Hypersensitivity reactions

(11) Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.

(12) Immunology of Transplantation and Malignancy

(13) Immune haematology

iii. Systematic bacteriology:

(1) Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus and Meningococcus - brief account of each coccus - detailed account of mode of spread laboratory diagnosis, Chemo therapy and prevention.

(2) Detailed account of Cariogenic Streptococci

(3) Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.

(4) Mycobacteria - Tuberculosis and Leprosy

(5) Clostridium - Gas gangrene, food poisoning and tetanus.

(6) Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.

(7) Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii, Actinomycetes.

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iv. **Virology:**

(1) Introduction

(2) General properties, cultivation, host - virus interaction with special reference to Interferon.

(3) Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.

(4) A few viruses of relevance to dentistry.

a) Herpes Virus

b) Hepatitis B Virus - brief about other types

c) Human Immunodeficiency Virus (HIV)

d) Mumps Virus

e) Brief- Measles and Rubella Virus

(5) Bacteriophage - structure and Significance

v. **Mycology:**

(1) Brief Introduction

(2) Candidosis - in detail

(3) Briefly on oral lesions of systemic mycoses.

vi. **Parasitology:**

(1) Brief introduction - protozoans and helminthes

(2) Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

d) Theory: 65 Hours

	Topics	Hours
I.GENERALBACTERIOLOGY		
1.	Introduction, History and classification.	02
2.	Morphology, Physiology of Bacterial cell.	02
3.	Bacterial Genetics	02
4.	Infection	02
II.IMMUNOLOGY		
1.	Immunity	02
2.	Antigen	01
3.	Antibodies	01
4.	Structures and functions of Immune system	01
5.	Immune response	01
6.	Antigen and antigen reactions &compliment	04
7.	Hypersensitivity	03
8.	Autoimmunity	01

9.	Immunology of transplantation	01
III.SYSTEMATICBACTERIOLOGY		
1.	Staphylococci	01
2.	Streptococci (Dental Caries)	02
3.	Pneumococci	01
4.	Meningococci &Gonococci	01
5.	Corynebacterium diphtheria	02
6.	Bacillus	01
7.	Clostridia	02
8.	Non sporing Anaerobes	02
9.	Mycobacteria	03
10.	Spirochaetes (Treponema, leptospira and Borrelia)	03
11.	Normal bacterial flora of the Oral Cavity	01
IV.VIROLOGY		
1.	General properties of viruses	03
2.	Herpes viruses	02
3.	Measles and Mumps	01
4.	Rabies virus.	01
5.	Hepatitis viruses	02
6.	Human Immunodeficiency Virus(HIV)	01
7.	Oncogenic viruses &Poliomyelitis	02
V. PARASITOLOGY		
1.	Introduction to parasitic diseases	01
2.	Entamoeba histolytica, Malaria, Leishmania	03
VI. MYCOLOGY		
1.	Candidiasis (in detail)	02
2.	Rhinosporidiosis	02
VII.APPLIEDMICROBIOLOGY		
1.	Immunisation schedule, Collection of materials, Experimental animals &hospital infections – in brief	02

vii. Practicals/Demonstrations: 50 Hours

(I) Demonstrations:

a) Morphological forms of microbes

b) Different morphological forms of bacteria, viruses, fungi, parasites.

c) Sterilization Methods – Specified techniques – their uses.

d) Culture Media – transport media

e) Special staining techniques, stained preparations – dark ground microscopy.

f) Demonstration of bacteria in stained clinical material.

g) Demonstration of viruses – Permanent preparations morphology, inclusion bodies.

h) Demonstration of parasite – in blood smear – in stool – in urine.

i) Demonstration of common fungi – candida – Dermatophytes.

(2) ***Practicals:***

a) Simple staining of bacteria

b) Gram's staining – isolated bacteria – Clinical materials.

c) Ziehl-Neelsen staining – prepared and fixed smears.

d) Collection of materials for culture – pus, blood.

(3) ***List of practical materials*** slides *for demonstration:*

a) Staphylococcus

b) Streptococcus

c) Gonococcus

d) Pneumococcus

e) Mycobacterium Tuberculosis

f) Mycobacterium leprae

g) Anthrax

h) Cl. Tetani

i) Spirochaetes

j) Gram Negative Bacilli

k) Candida

l) Actinomyces

(4) **Slides for practical exercises:**

a) Grams stains

(i) Staphylococci

(ii) Gram negative bacilli

(iii) Mixture of any two organisms

(iv) Gram stain of the oral cavity

b) Albertsstain–Kleb's Loffeler's Bacilli(KLB)culture, slide

c) Ziehl-Neelson'sstain -Sputum positive for AFB

(5) **Media for demonstration:**

i. Un-inoculated media:

(i) Nutrient agar plate

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(ii) Blood agar plate

(iii) Chocolate agar plate

(iv) Macconkey agar plate

(v) Glucosecitrate broth(Blood culture bottle)

(vi) Lowenstein Johnson's Mediaslope

(vii) Loefflers serum slope

(viii) Sabourauds slope

(ix) Milk agar plate

(x) Robert Cooked Meat broth

ii. Inoculated media:

(i) Nutrient agar with staphylococci

(ii) Blood Agar with Alpha Haemolytic Streptococci

(iii) Blood Agar withBeta Haemolytic Streptococci

(iv) Potassium Tellurite with growth of C.diphtheriae

(v) Milk agar with staphylococci

(vi) Antibiotic sensitivity plate

iii. Animals:

(i) Guinea pig

(ii) Rabbit

(iii) Mice

iv. Instruments:

(i) VDRL slide

(ii) Tuberculin syringe

(iii) Sterile swab

(iv) Seitz filter

(v) MacIntosh Fildes jar

(vi) Widal rack with tubes

(vii) Microtitre plate

(viii) Disposable syringe

(ix) Surgical gloves

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e) *SCHEME OF EXAMINATION*

i. Theory

Distribution of Topics and Type of Questions for University written examination:

Contents	Type of Questions and Marks	Marks
One Long Essay question from Systematic Bacteriology	Structured Essay 1 x 10marks	10
One question from General bacteriology One question from Immunology One question from Mycology One question from Parasitology / Oral Microbiology One question from Systematic Bacteriology	Short notes 2 x 5marks	10
One question from General bacteriology One question from Immunology One question from Systematic Bacteriology Two questions fromVirology	Brief Notes 5x3marks	15
	Total	**35**

iii. *Theory:*

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

iv. *Practicals:*

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Mark distribution for University practical examination

Spotters

Slides	5x 2 Marks
Media	3x2 Marks
Instruments	2x2 Marks
Gram's Stain	7 Marks
Ziehl-Neelsen's Stain	8 Marks
Practical work record	5 Marks

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7 DENTAL MATERIALS

a) *INTRODUCTION:*

The science of Dental Material has undergone tremendous changes over the years. Continued research has led to new material systems and changing concepts in the dental field. Interlinked with various specialized branches of chemistry, practically all engineering applied sciences and biological characteristics, the science of dental material emerged as basic sciences in itself with its own values and principles.

b) AIMS:

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures.

c) *OBJECTIVES:*

To understand the evolution and development of science of dental materials. Impart knowledge of physical and chemical properties and advantages and disadvantages of various materials used in dentistry. Acquire knowledge of biomechanical requirements of particular restorative material and its application & limitations. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals. Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials.

At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

d) *NEED FOR THE COURSE:*

The profession has to raise from an art to a science, the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different types of materials. There is growing concern of health hazards due to mercury toxicity, inhalation of certain vapors or dust materials, irritations and allergic reaction to skin due to contact of materials. The Dentist must acquire wider knowledge of physical, chemical and biological properties of the various materials used in the mouth because they may cause irritation of oral tissues. pH of some of the restorative materials causes inflammation and

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necrosis of pulp which is a concern and the patient should be protected from these. Certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically acceptable.

e) ***SCOPE:***

Dental materials are employed in mechanical procedures including restorative dentistry such as Prosthodontics, Endodontics, Periodontics and Orthodontics. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and Periodontics require less use of materials but the physical and chemical characters of materials are important in these fields. The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0-70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

f) ***THEORY: 80 HOURS (20 hours in First BDS & 60 hours in second BDS)***

Section A- Prosthodontics, Section B- Conservative Dentistry

Sl. No	Topic	Hours
1.	**Introduction - Section A Prosthodontics & Section B Conservative Dentistry**	**2**
2.	Structure of matter and principles of adhesion- Section A Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.	**2**
3.	**Important physical properties applicable to dental materials - Section B** Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion	**6**

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	resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour - hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication.	
4.	**Biological considerations in use of dental materials- Section B** Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility, eg. Contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-effecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenecity and carcinogenicity. Disinfection of dental materials for infection control.	2
5.	**Gypsum & gypsum products- Section A** Gypsum - its origin, chemical formula, Products manufactured from gypsum. Dental plaster, Dental stone, Die stone, high strength, high expansion stone. Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Supplied as and Commercial names. Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material. Setting time: working time and setting time, Measurement of setting time and factors controlling setting time. Setting expansion, Hygroscopic setting expansion - factors affecting each. Strength: wet strength, dry strength, factors affecting strength, tensile strength Slurry - need and use. Care of cast. ADA classification of gypsum products Description of impression plaster and dental investment Manipulation including recent methods or advanced methods. Disinfection: infection control, liquids, sprays, radiation Method of use of disinfectants Storage of material - shelf life.	4
6.	**Impression materials used in dentistry- Section A** Impression plaster, Impression compound, Zinc oxide Euginol impression paste & bite registration paste incl., non Euginol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate. Historical background & development of each impression material, Definition of impression, Purpose of making impression, Ideal properties required and application of material.	10

	Classification as per ADA specification, general & individual impression material. Application and their uses in different disciplines. Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting, Control of setting time, Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancement in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, and compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction, Shelf life & storage of material. Infection control - disinfection Advantages & disadvantages of each material.	
	Synthetic resins used in dentistry - Section A Historical background and development of material, Denture base materials and their classification and requirement. Classification of resins, Dental resins - requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co-polymerization, molecular weight, crosslinking, plasticizers, Physical properties of polymers, polymer structures types of resins.	3
7.	**Acrylic resins: - Section A** Mode of polymerisation: Heat activated, Chemically activated, Light activated Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.	3
	Restorative resins: - Section B Historical background, Resin based restorative materials, unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage. Classification of Composites: Application, composition and properties of each, Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility - microleakage, pulpal reaction, pulpal protection Manipulation of	4

	composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites. Direct bonding, Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system - Indirect & direct, Core build up, Orthodontic applications.	
8.	**Metals and alloys - Section B** Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, and Constitutes or equilibrium phase diagrams: Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment Tarnish and corrosion Definition, causes of corrosion, protection against corrosion, Corrosion of dental restorations, clinical significance of galvanic current. Dental amalgam- Section B History, Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as. Amalgamation: setting reaction & resulting structure, properties, Micro leakage Dimensional stability, Strength, Creep, Clinical performance Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration. Repair of amalgam, mercury toxicity, mercury hygiene. Direct filling gold- Section B Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material. Classification: Gold Foil, Electrolytic precipitate, powdered gold Manipulation: Removal of surface impurities and compaction of direct filling gold. Physical properties of compacted	10
9.	**Dental casting alloys - Section B** Historical background, desirable properties of casting alloys. Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures). Classification of casting alloys: By function &	6

	description. Recent classification, High noble (HN), Noble (N) and predominantly base metal (PB) Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal, Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion. Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment: Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application, properties & advantages. Technical considerations in casting. Heat source, furnaces, gold, Clinical performance.	
10	**Dental waxes including inlay casting wax - Section B** Introduction and importance of waxes: Sources of natural waxes and their chemical nature. Classification of Waxes: Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply: Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes. Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths. Other waxes: Applications, mode of supply & properties. Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions Bite registration wax.	**2**
11	**Dental casting investments - Section A** Definition, requirements, classification Gypsum bonded - classification. Phosphate bonded, Silica bonded Mode of Supply: Composition, application, setting mechanism, setting time & factors controlling. Expansions: Setting expansion, Hygroscopic Setting expansion, & thermal expansion: factors affecting. Properties: Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.	2
12	**Soldering, brazing and welding - Section B(Classes to be handled by orthodontics department)** Need of joining dental appliances, Terms & Definition, Solders: Definition, ideal requirement, types of solders - Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties. Tarnish & corrosion	**2**

	resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing: free hand soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.	
13	**Wrought base metal alloys - Section A (Classes to be handled by orthodontics department)** Applications and different alloys used mainly for orthodontics purpose Stainless steel Cobalt chromium nickel Nickel titanium Beta titanium Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation, Mechanical properties - strength, tensile, yield strength, KHN. Braided & twisted wires their need, Solders for stainless steel, Fluxes, Welding. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties. Nickel - Titanium alloys, shape, memory & super elastic Titanium alloys, application, composition, properties, welding, Corrosion resistance	3
14	**Dental cements- Section B** Definition & Ideal requirements of Dental Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide Euginol, modified zinc oxide Euginol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate Cavity liners and cement bases Varnishes Calcium hydroxide. Gutta percha Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechansim of caries inhibition. Agents for pulpal protection, Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.	5
15	**Dental ceramics - Section A** Historical background & General applications of Dental ceramics: definition, classification, application, mode of supply, manufacturing procedure, methods of	8

	strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations. Metal Ceramics (PFM): Alloys - Types and composition of alloys Ceramic - Type and Composition. Metal Ceramic Bond, Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.	
16	**Abrasion & polishing agents - Section A** Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminum oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide. Abrasive action. Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed. Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration, Material and procedure used for abrasion and polishing Electrolytic polishing and burnishing.	**1**
17	**Die and counter die materials including electroforming and electro polishing - Section A** Types - Gypsum products, Electroforming, Epoxy resin, Amalgam	**1**
18	**Dental implants - Section A** Evolution of dental implants, types and materials.	**2**
19	**Mechanics of cutting - Section B** Burs and points.	**1**
20	**Waste disposal - Section B** At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use. (1) Qualitative observation of restorative dental resins. (2) Determination of setting time of chemically activated composite resins.	**1**

g) ***PRACTICALS: 240 Hours (40 hours in First BDS & 200 Hours in second BDS)***

Demonstration of manipulation of all materials (for a batch not more than 8 students).

Exercises to be done by each student:

Impression material

Manipulation, making impressions, identifying setting time and defects. (Comparative studies included)

Gypsum products

Manipulation, pouring impressions-identify setting time and working time and relation of working time with reference to proportion of water, change in temperature and spatulation time.

Self-cure and heat cure acrylic resin-manipulation and curing.

Cements-manipulation and studying setting time and working time for luting, base and restoration.

Silver Amalgam-manipulation, trituration, condensation and studying setting and working time.

h) *SCHEME OF EXAMINATION:*

The University Theory examination will have two sections of 35 marks each Section A Prosthodontics & Section B Conservative Dentistry *(overlapping of topics may occur)*

For Dental Materials University Practical Examination, if internal examiner is from Prosthodontics, External examiner should be from Conservative Dentistry and vice versa

Distribution of Topics and Type of Questions for written examination

Section A: Prosthodontics

Contents	Types of Questions and Marks	Marks
Question from any Prosthodontic topic preferably included in Section A	Structured Essay 1x 10marks	10
Questions from any Section A topic including orthodontics. Avoid questions in the topic from which long essay question is set	Short Notes 2 x 5marks	10
	Brief Notes 5x3marks	15
	Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Spotters *(5x 2Marks)* *10 Marks*

Manipulation of Any one of the following Dental materials: *25 Marks*

Gypsum products

Irreversible Hydrocolloid

Impression Compound

Rubber base impression Material

Zinc Oxide Impression Material

Heat cured PMMA

Practical Work Record *5 Marks*

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Distribution of Topics and Type of Questions for University Written examination:

Section B: Conservative Dentistry

Contents	Types of Questions and Marks	Marks
Question from Any Conservative Dentistry topic preferably included in Section B	Structured Essay 1x 10marks	10
Questions from any Section B topic including orthodontics. Avoid questions in the topic from which long essay question is set	Short Notes 2 x 5marks	10
	Brief Notes 5x3marks	15
	Total	**35**

i. ***Theory:***

University written Examination: **35Marks**
University Viva: **10Marks**
Internal Assessment: **5 Marks**
Total: 50 Marks

ii. ***Practicals:***

Internal Assessment: **10 Marks**
University Practicals: **40Marks**
Total: 50 Marks
Grand Total 100Marks

Spotters *(5x 2Marks)* *10 Marks*

Manipulation of Any one of the following Dental Cements: *25 Marks*

ZnO Euginol (Luting/Filing Consistency)

Zinc Phosphate Cement (Luting/base Consistency)

Glass Ionomer Cement Type I/II (Luting/Filling Consistency)

Polycarboxylate Cement (Luting Consistency)

Amalgam Trituration

Practical Work Record *5 Marks*

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8. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

a) *GOAL:*

The broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession.

b) *OBJECTIVES:*

At the end of the course the student shall be able to:

i. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular,

ii. List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason,

iii. Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs,

iv. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients,

v. Integrate the rational drug therapy in clinical pharmacology,

vi. Indicate the principles underlying the concepts of "Essential drugs".

vii. Recognise and report adverse drug reaction to suitable authorities.

c) *SKILLS:*

At the end of the course the student shall be able to:

i. Prescribe drugs for common dental and medical ailments.

ii. To appreciate adverse reactions and drug interactions of commonly used drugs.

iii. Observe experiments designed for study of effects of drugs.

iv. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

d) *INTEGRATION:*

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

e) *THEORY: 70 HOURS*

1. General Pharmacology :	
a. Definitions: Pharmacology, drug, Pharmacy, sources of drugs with examples.	1
b. Pharmacokinetics with clinical implications.	2
c. Routes of administration: oral, inhalation, intradermal, Subcutaneous, Intramuscular, intravenous, intrathecal, perineural &Newer drug regimes. (Advantages and disadvantages with the examples of drugs administered).	1
d. Pharmacodynamics: mechanism of action, factors modifying drug actions	2

with emphasis on factors like-age, sex, dose ,frequency & route of administration, presence of other drugs, Pharmacogenetics and Pathological conditions.	
e. Therapeutics: Principles of drug therapy, Adverse drug reactions and drug interactions.	3
2.ANS drugs: Clinically used examples, their important pharmacological actions (which form the basis for the uses),clinical uses along with dental uses if any and specific adverse effect s of-	
a. Sympathomimetics	1
b. Sympatholytics-alphablockers, Beta -blockers.	2
c. Cholinomimetics.	2
d. Anticholinergics & Skeletal muscle relaxants	2
3. Detailed pharmacology of:	
a.Clinically used opioid and non-opioid analgesics.	2
b. Clinically used local anesthetics.	2
Detailed Pharmacology &Enumeration of clinically used agents, their brief Pharmacology, clinical uses along with dental uses if any, and specific adverse effects of:	
a. Ethylalcohol- actions, uses and drug interactions.	1
b. General anesthetics & Pre-anaesthetic medication	2
c. Antipsychotics, antidepressants, anxiolytics	2
d. Sedativehypnotics	2
e. Antiepileptics	1
CVS drugs: Enumeration/Classification of clinically used agents their important pharmacological actions(that form the basis of their uses)Clinical uses along with dental uses if any, and specific adverse effects of	
a. Cardiac glycosides	1
b. Antiangina drugs	1
c. Antihypertensives.	1
d. Diuretics	1
e. Pharmacotherapy of shocks-anaphylactic, cardiogenic hypovolemic &Septic.	1
Drugs acting on blood: Detailed pharmacology of:	
a. Coagulants, anticoagulants, fibrinolytics, antiplatelet drugs and styptics	3
b. Hematinics: Iron preparationVit.B12,FolicacidVit.C	3
c. Vit.D and calcium preparations	1
Endocrines: Enumeration/Classification of clinically used agents and their preparations, Mechanism of action, clinical uses along with dental uses if any and specific adverse effects of:	
a. Drugs used in diabetes mellitus	2
b. Corticosteroids	2
Chemotherapy: Enumeration/Classification of clinically used Agents, their mechanism of	

action clinical uses along with dental uses if any and specific adverse effects of:	
a. Sulfonamides	1
b. Beta-lactum antibiotics	2
c. Macrolides and aminoglycosides	1
d. Broad spectrum antibiotics	1
e. Antifungal and antiviral (acyclovir) agents	2
f. Metronidazole and fluoroquinolones	1
g. Antineoplastic Drugs: Alkylating agents, Antimetabolities, Radioactive Isotopes, Vinka Alkaloids, Anticancer antibiotics.	2
h. Drug Therapy of Tuberculosis, Leprosy & Malaria	3
Other drugs: Enumeration o clinically used agents, general uses along with dental uses if any and specific adverse effects of:	
a. Antihistamines and anti emetics	2
b. Drugs used in bronchial asthma and cough	1
c. Drugs used in peptic ulcer	2
d. Chelating agents-BAL, EDTA & Penicillamine	1
e. Antihelminthics	2
Dental Pharmacology	
a. Fluoride pharmacology	1
b. Antiseptics, astringents & Sialogogues	1
c. Obtundents, Mummifying agents and disclosing agents	1
d.***Prevention and drug therapy of emergencies in dental practice***	2
1. Seizures	
2. Anaphylaxis	
3. Severe bleeding	
4. Shock	
5. Tetany	
6. Status asthmaticus	
7. Acute addisonian crisis	
8. Diabetic Ketoacidosis	

f) PRACTICALS AND DEMONSTRATIONS: 20 HOURS

To familiarise the student with the methodology: prescription writing and dispensing.

Rationale of drug combinations of marketed drugs.

Sl. No.	Procedure	Hours
1	Introduction-equipments used in dispensing pharmacy, prescription-parts and model prescription.	2
2	Demonstration of common dosage forms used in clinical practice	
3	Mixtures-one example(Expectorant/Salicylate)of simple and diffusible (Bismuth Kaolin/chalk)mixtures	2

4	Emulsion-Types and example(Liniment turpentine/Shark liver oil) of emulsion	2
5	Powders-toothpowder	2
6	Mandl's paint/Gum paint percentage dilution-concept and calculations with suitable examples.	2
7	Mouthwashes-Alkaline, antiseptic, astringent	2
8	Toothpastes	2
9	Prescription writing for15 general conditions commonly encountered in clinical practice. eg. Bronchial asthma, hypertension congestive heart failure, angina pectoris, peptic ulcer, bacillary dysentery,diabetes mellitus, diabetic coma, osteoarthritis, anaphylaxis, status asthmaticus, Status epilepticus, iron deficiency & pernicious anaemia	2
10	Dental prescriptions for about fifteen dental conditions commonly encountered in practice eg. Acute necrotising ulcerative gingivitis, acute herpetic gingivitis/stomatitis, acute gingival abscess, pericoronal abscess (impacted teeth), dental caries, aphthous ulcers, hypersensitive dentine, dentoalveolar abscess, xerostomia, acute toothache, post-operative pain, post extraction pain with swelling, oral candidiasis, acute tonsillitis/ pharyngitis,common cold,scurvy etc.	2

A work record should be maintained by all students and should be submitted at the time of examination after due certification from the Head of the Department.

To appear for IIBDS preclinical Prosthodontics examination it is Mandatory that Laboratory exercises from Nos. 1 to 11 mentioned in the table above are completed.

b) SCHEME OF EXAMINATION

I. Practicals

***University practical** examination*	*60*
University Viva Voce	*20*
Internal Assessment	*20*
Grand Total	*100*

***Distribution of Marks for** Preclinical Prosthodontics University Practical Examination*

(1) Arrangement of teeth in class I relation, Waxing, Carving & Polishing: 35 Marks

(2) Drawing the Design for a Cast Partial Denture and marking its components 15 Marks

(3) Preclinical Practical Work Record 10 Marks

Note: Preclinical viva should be limited to, Laboratory Procedures related to Complete Denture Fabrication, Articulators, Anatomical landmarks, Impression Procedures, Introduction to jaw relation recording, Selection & arrangement of teeth, Complete Denture Occlusion, Try in Procedures and Components of RPD & FPD.

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12. GENERAL MEDICINE

a) *GUIDELINES:*

Special emphasis should be given throughout on the importance of various diseases as applicable to dentistry.

i. Special precautions/ contraindication for anaesthesia in oral and dental procedures in different systemic diseases.

ii. Oral manifestations of systemic diseases.

iii. Medical emergencies in dental practice.

A dental student should be taught in such a manner that he/she is able to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body, diseases of the heart, lungs, kidneys, blood etc. He should be capable of handling medical emergencies encountered in dental practice.

b) *THEORY: 60 HOURS*

CORE TOPICS	Hours
1. Aims of medicine, definitions of diagnosis, treatment & prognosis. History taking, Physical examination of the patient, diagnosis and management of disease. Genetics and disease, Medical Ethics.	2
2.Infections: Enteric fever, HIV, Herpes simplex, Herpes zoster, Syphilis ,Diphtheria, Malaria, Actinomycosis, Viral hepatitis, Tuberculosis. Infectious mononucleosis Mumps, Measles, Rubella, Leprosy, Organisation and functions of the immune systems.	5
3. G.I.T: Stomatitis, Gingival hyperplasia, Dysphagia, Acid peptic disease, Jaundice, Acute and chronic hepatitis, Cirrhosis of liver, Ascitis, Amoebiasis, Tender hepatomegaly, Hepatotoxic drugs, Portal hyper tension. Diarrhoea and Dysentery including Malabsorbtion syndromes,Helicobacter pylori.	5
4. CVS :Acute rheumatic fever Valvular heart disease, Hypertension, Ischemic heart disease (myocardial infarction), Infective endocarditis, Common arrhythmias, Classification of congenital heart disease, Congestive cardiac failure. Heart failure, Fallot's tetralogy, ASD, VSD.	7
5.Respiratory System: Applied Anatomy and physiology of RS, Pneumonia, COPD, Pulmonary tuberculosis, Bronchial asthma, Pleural effusion, Acute respiratory tract infections, Pulmonary embolism, Suppurative lung diseases, and Lung abscess. Pneumothorax, Bronchiectasis Lung Cancer, Empyema, Sleep apnea, ARDS, Respiratory failure.	6
6.Hematology: Hematopoiesis, Anaemias, Bleeding & Clotting disorders, Acute and chronic myeloid leukemias, Agranulocytosis and Neutropenia, Thrombocytopenia , Splenomegaly Lymphomas, Oral manifestations of haematological disorders, Generalized Lymphadenopathy. Principles of blood and blood products transfusion, Thromboembolic disease, Oncogenesis, Haemolytic anemia, DIC (Disseminated intravascular	7

Coagulation).	
7.Renal System :Acute nephritis and Nephrotic syndrome, U.T.I Renal function tests ,CRF	5
8. Nutrition: Balanced diet, PEM, Vitamin deficiency disease, Calcium and phosphate metabolism, Flurosis, Osteomalacia, Osteoporosis.	4
9. CNS: Facial palsy, Facial pain Trigeminal neuralgia, Epilepsy, Headache includlng migraine. Meningitis (Acute and Chronic) Anticonvulsants, Examination of comatose patient, Examination of cranial nerves.	7
10. Endocrine: Diabetes mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids. Addison's disease, Cushing's syndrome, Parathyroid disease and calcium metabolism, Preoperative assessment of diabetic patients, Acute adrenal deficiency.	6
11. Critical care: Syncope, Cardiac arrest, Cardio Pulmonary Resuscitation (CPR), Cardiogenic shock, Anaphylaxis, Allergy, Angio -neurotic edema. Acute LVF, ARDS, Coma.	4
Miscellaneous: Adverse drug reactions, Drug interactions. Rheumatoid disease, Osteoarthritis, Scleroderma.	

c) ***CLINICAL TRAINING: 90 HOURS (posting in a general hospital)***

The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, temperature, edema, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, and oral cavity) and be able to examine CVS, RS, abdomen and facial nerve and signs of meningeal irritation.

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d) *SCHEME OF EXAMINATION*

Distribution of Topics and Types of Questions for University Written Examination:

Types of Questions and Distribution of Marks	Total Marks
Structured Essays 2x 10marks	20
Short notes 4 x 5marks	20
Brief notes 10x3marks	30
Total	**70**

i. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

ii. Clinical:

University Clinical Examination:		80 Marks
Case History	*15 Marks*	
Clinical Examination	*30 Marks*	
Investigation	*10Marks*	
Diagnosis & D.D	*15 Marks*	
Management	*10 Marks*	
Internal Assessment:		**20 Marks**

Grand Total 200Marks

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13. GENERAL SURGERY

a) *AIMS:*

To acquaint the student with various diseases which may require surgical intervention. And to train the student to analyze the disease history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

b) *OBJECTIVES:*

Skills to be developed by the end of teaching are to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

c) *THEORY: 60 HOURS*

Sl. No.	Topic	Hours
1	HISTORY OF SURGERY: The development of surgery as a specialty over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialties in the practice of modern surgery.	1
2	GENERAL PRINCIPLES OF SURGERY: Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.	2
3	PRINCIPLES OF OPERATIVE SURGERY: Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.	1
4	WOUNDS: Their classification, wound healing, repair, treatment of wounds, skin grafting, medicolegal aspects of accidental wounds and complications of wounds.	3

5	INFLAMMATION: Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.	1
6	INFECTIONS: Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysipelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxaemia and septicaemia.	5
7	TRANSMISSABLE VIRAL INFECTIONS: HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.	2
8	SHOCK AND HAEMORRHAGE: Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage -different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.	5
9	TUMOURS, ULCERS, CYSTS, GANGRENE, SINUS, AND FISTULAE: Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, gangrene, sinus and fistulae.	9
10	DISEASES OF LYMPHATIC SYSTEM: Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.	1
11	DISEASES OF THE ORAL CAVITY: Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.	2
12	NECK SWELLINGS – Midline and Lateral swellings, Cystic and Solid swellings –Classification, Differential diagnosis, Treatment	1
13	DISEASES OF LARYNX, NASOPHARYNX: Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.	2
14	NERVOUS SYSTEM: Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve And its management. Trigeminal neuralgia, its	1

	presentation and treatment.	
15	FRACTURES: General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.	1
16	HEAD INJURY MANAGEMENT	1
17	MANAGEMENT OF SEVERELY INJURED PATIENT – RESUSCITATION	1
18	DISEASES OF ARTERIES AND VEINS IN GENERAL –Varicose veins, Atherosclerosis, Aneurysm, Carotid Body tumours	1
19	ANOMALIES OF DEVELOPMENT OF FACE: Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.	1
20	DISEASES OF THYROID AND PARATHYROID: Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.	2
21	SWELLINGS OF THE JAW: Differential diagnosis and management of different types of swellings of the jaw, Osteomyelitis of mandible	2
22	BIOPSY: Different types of biopsies routinely used in surgical practice.	1
23	BURNS AND SCALDS	1

Desirable to know: Introduction to oncology, radiotherapy, surgery and genetic engineering

E.N.T: Ear: Middle ear infection; Nose: Para nasal sinuses; Throat: Tonsillitis & Peritonsillar Abscess

d) CLINICALS: 90 HOURS (posting in a general hospital)

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e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written examination:

Types of Questions and Distribution of Marks	Total Marks
Structured Essays 2x 10marks	20
Short Notes 4 x 5marks	20
Brief Notes 10x3marks	30
Total	70

i. *Theory*

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

ii. *Clinical:*

University Clinical Examination: 80 Marks

Long Case

Case History	*15 Marks*
Clinical Examination	*30 Marks*
Suggested Investigations	*10Marks*
Diagnosis & D.D	*15 Marks*
Management	*10 Marks*

Internal Assessment: 20 Marks

Grand Total 200Marks

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14. ORAL PATHOLOGY & ORAL MICROBIOLOGY

a) *OBJECTIVES:*

At the end of Oral Pathology & Microbiology course, the student should be able to:

i. Comprehend the different types of pathological processes that involve the Orofacial tissues.

ii. Comprehend the manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.

iii. Understand the oral manifestations of systemic diseases and correlate with the systemic physical signs & laboratory findings.

iv. Understand the underlying biological principles governing treatment of oral diseases.

v. Understand the principles of certain basic aspects of Forensic Odontology.

b) *SKILLS:*

The Following skills are to be developed:

i. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides

ii. Study of the disease process by surgical specimens

iii. Study of teeth-anomalies/polymorphisms through tooth specimens & plaster casts.

iv. Microscopic study of plaque pathogens

v. Study of haematological preparations (blood films) of anaemias & leukemias

vi. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

c) *THEORY: 145 Hours (II yr. 25 hrs. III yr. 120 hrs.)*

Sl. No:	Topics for II year	Description	Hours
1	Introduction	Scope and Outline of Oral Pathology, Broad divisions, Interrelationship with medical specialities	1
2	Developmental disturbances of oral & paraoral structures	a) Developmental disturbances of Jaws - Agnathia, Micrognathia, Macrognathia, Facial Hemihypertrophy, Facial Hemiatropy b) Developmental Disturbances of lips and palate - Congenital Lip pits and Commissural pits and fistulas	

		- Double lip, Cleft lip, cleft Palate, Chelitis Glandularis, Chelitis Granulomatosa, Hereditary Intestinal Polyposis, Hereditary Melanotid Macule c) Developmental disturbances of Oral Mucosa - Fordyce's Granules - Focal epithelial Hyperplasia d) Developmental disturbances of gingiva - Fibromatosis Gingiva, Retrocuspid Papilla e) Developmental Disturbances of Tongue - Macroglossia, Microglossia, Ankyloglossia, Cleft Tongue, Fissured Tongue, Median Rhomboid Glossitis, Benign Migratory Glossitis, Hairy Tongue. f) Development disturbances of oral lymphoid tissue: - Reactive lymphoid aggregates - Lymphoid hamartoma - Angiolymphoid Hyperplasia - Lympho-epithelial cyst g) Developmental disturbances of salivary glands: - Aplasia, Xerostomia, Hyperplasia of the palatal glands, Atresia, Abberrancy, Stafine's cyst h) Developmental disturbances in size of teeth: - Microdontia, Macrodontia i) Developmental disturbances in the shape of the teeth: 79 - Fusion, Germination, Concrescence, Dilacerations, Talon's Cusp, Dens in Dente, Dens Evaginatus, Taurodontism, Supernumerary Roots, Enameloma j) Developmental Disturbances in number of teeth - Anodontia, Supernumerary teeth, Predecidious and Post	14

		Permanent dentition k) Developmental Disturbances in Structure of Teeth: - Amelogenesis Imperfecta, Enamel Hypoplasia, Dentinogenesis Imperfecta, Dentinal dysplasia, Regional Odontodysplasia, Shell Teeth. l) Developmental Disturbances in eruption of teeth: - Premature Eruptions, Eruption Sequestrum, Delayed Eruption, Multiple Unerupted teeth, Submerged Teeth. m) Developmental / Fissural cysts of the Oral cavity - Median palatal cyst, Globulomaxillary cyst, Median Mandibular cyst, Naso-alveolar cyst, Palatal cyst of neonates, Thyroglossal duct cyst, Epidermoid, and Dermoid cyst, Nasopalatine cyst.	
3	**Dental caries**	Theories, Clinical features, Classification, Histopathology, Microbiology of Dental caries ,Immunology, Caries activity tests, Factors influencing caries	4
4	**Diseases of the Pulp & Periapical tissues**	a) Diseases of the Dental Pulp - Pulpitis, Focal Reversible Pulpitis, Chronic Pulpitis, Pulp Polyp. b) Diseases of the Periapical Tissues - Periapical Granuloma, Periapical Abscess, Periapical Cyst c) Osteomyelitis - Acute Suppurative Osteomyelitis, Chronic Focal and Diffuse Sclerosing Osteomyelitis, Garre's Ostemyelitis Sequelae of periapical abscess - summary of space infections, systemic complications & significance Cellulitis, Ludwig's angina, Intra cranial complication of dental infection, Maxillary sinusitis, Focal infection and foci of infection	6
	Topics for III Year	**Description**	
1	Benign and	Classification of Odontogenic, Non-Odontogenic & Salivary	

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	malignant tumours of Oral cavity	Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-	1
		1.Odontogenic tumours	
		-Classification	
		Benign	
		a.Odontogenic epithelium without odontogenic ectomesenchyme-Ameloblastoma, Calcifying Epithelial Odontogenic Tumour, Adenomatoid Odontogenic Tumour, Squamous Odontogenic tumour	
		b.Odontogenic epithelium with Odontogenic ectomesenchyme-Ameloblastic Fibroma ,Ameloblastic fibro odontoma, Odontoma,Dentinogenic Ghost cell Tumour	9
		c.Odontogenic ectomesenchyme with or without included odontogenic epithelium-Peripheral and Central odontogenic fibroma, Odontogenic Myxoma, Benign cementoblastoma	
		Malignant	
		a.Odontogenic carcinomas: Metastasizing ameloblastoma, Ameloblastic carcinoma	
		2. Non-odontogenic	
		a. Benign tumours of epithelial tissue origin	
		-Papilloma, Keratoacanthoma,Nevus	30
		b. Premalignant lesions and conditions	
		-Definition, Classification	
		-Epithelial dysplasia	
		-Leukoplakia, Carcinoma in situ, Erythroplakia, Oral submucous fibrosis	
		c. Malignant tumours of epithelial tissue origin	
		-Basal cell carcinoma, Epidermoid carcinoma (Epidemiology, etiology, clinical & histological features, Grading and TNM staging), Verrucous carcinoma ,Malignant melanoma, Recent advances in diagnosis , management and prevention of Oral cancer	
		d. Benign tumours of Connective tissue origin	
		-Fibroma, Giant cell fibroma, Peripheral and Central ossifying fibroma,	

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		Lipoma, Haemangioma(different types), Lymphangioma, Chondroma, Osteoma, Osteoid osteoma, Benign osteoblastoma, Tori and Multiple exostoses e. Tumour like lesions of Connective tissue origin- -,Peripheral ossifying fibroma f. Malignant tumours of Connective tissue origin -Fibrosarcoma, Chondrosarcoma, Kaposi's sarcoma, Ewing's sarcoma, Osteosarcoma ,Hodgkin's and Non Hodgkin's lymphoma, Burkitt's lymphoma, Multiple myeloma, Solitary Plasma cell myeloma g. Benign tumours of Muscle tissue origin -Leiomyoma, Rhabdomyoma, Congenital Epulis of new born, Granular cell tumour h. Benign and Malignant tumours of Nerve tissue origin -Neurofibroma and Neurofibromatosis, Schwannoma, Melanotic neuroectodermal tumour of infancy, Malignant Schwannoma. i. Metastatic tumours of Jaws and Soft tissues of Oral cavity 3. Salivary Gland Benign neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma. Malignant neoplasms –Malignant Pleomorphic adenoma Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.	8
2	Cysts of the Oral & Paraoral region	Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts- Odontogenic keratocyst, Dentigerous cyst, Primordial cyst, Dental lamina cyst of newborn ,Gingival cyst of adults, Lateral periodontal cyst, Calcifying odontogenic cyst, Radicular cyst N on-Odontogenic cysts- Pseudocysts of jaws, Aneurysmal bone cyst, Traumatic bone cyst & soft tissue cysts of oral & paraoral region.	8
3.	Non neoplastic Salivary Gland	Sialolithiasis,Sialosis, Sialadenitis, Xerostomia & Ptyalism. Sjogren's syndrome ,Benign lymphoepithelial lesion,	2

	Diseases :	Necrotizing sialometaplasia	
4.	**Traumatic, Reactive & Regressive lesions of Oral Cavity :**	Pyogenic granuloma, Peripheral& Central Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer, mucocele & Traumatic Neuroma. Attrition, Abrasion, Abfraction Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth. Radiation effects of oral cavity, Allergic reactions of the oral cavity. -Angioedema, Stomatitis medicamentosa, Stomatitis venenata	5
5.	**Microbial infections of oral soft tissues :**	Microbiology, defense mechanisms including immunological aspects, oral manifestations, histopathogy and laboratory diagnosis of common bacterial, viral & fungal infections namely :- Bacterial: Scarlet fever, Diphtheria, Tuberculosis, Syphilis, Actinomycoses & its complications - Cancrum Oris, Tetanus, Noma. Viral: Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection and Oral manifestation of AIDS. Fungal : Candidiasis, Histoplasmosis Immunological diseases: Reccurent Aphthous stomatitis, Bechet's syndrome, Reiter's syndrome, Sarcoidosis.	10
6.	**Common non-inflammatory diseases involving the jaws**	Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of: Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's bone disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome , Down's syndrome and Histiocytosis X disease.	6
7.	**Biopsy, Cytology and Healing of Oral wounds**	Factors affecting healing of wounds -healing of extraction wound and Dry socket Biopsy-techniques, Healing of biopsy wound -Exfoliative cytology-Indications, Staining and Interpretation	4
8.	**Systemic Diseases**	Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of	4

	involving Oral cavity	Oral cavity. a. Blood dyscrasias-Clinico-pathological aspects and oral manifestations of Anemias,Polycythemia,Leukopenia,Neutropenia,Agranulocytosis,Chediak-Higashi syndrome, Leukocytosis, Infectious mononucleosis, Leukemias , Purpura Haemophilia b. Oral aspects of Disturbances in mineral metabolism c. Oral aspects of Avitaminosis and Hypervitaminoses d. Oral Aspects of Endocrine dysfunction	5
9.	Mucocutaneous lesions :	Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus.	10
10.	Periodontal Diseases :	Stains, Calculus, Dental plaque Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargement, ANUG, chronic desquamative gingivitis periodontitis and juvenile periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.	4
11.	Diseases of TM Joint	Ankylosis, luxation and subluxation, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.	2
12.	Diseases of the Nerves :	Facial neuralgias – Trigeminal, Sphenopalatine & Glossopharyngeal neuralgias, VII nerve paralysis, Causalgia Psychogenic facial pain & Burning mouth syndrome.	2
13.	Pigmentation of Oral tissues	Pigmentation of Oral & Paraoral region & Discolouration of teeth : Causes & clinical manifestations.	2
14.	Diseases of Maxillary Sinus	Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum	2
	Principles of Basic Forensic	Introduction, definition, aims & scope. Sex and ethnic (racial) differences in tooth morphology and	

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15.	**Odontology**	histological age estimation Determination of sex & blood groups from buccal mucosa / saliva. Dental DNA methods Bite marks, rugae patterns &lip prints Dental importance of poisons and corrosives Overview of forensic medicine and toxicology	6

d) *LABORATORY/PRACTICAL REQUIREMENTS*

Students have to maintain records of laboratory procedures/work done/report of practical:

i. *Oral Pathology and Microbiology*

Identification of the hard tissue anomalies:

- Microdontic tooth
- Macrodontic tooth
- Gemination of tooth
- Fused teeth
- Concrescence of tooth
- Dilaceration
- Dens in dente
- Dens evaginatus
- Supernumerary root
- Hypoplastic enamel
- Fluorosis
- Abrasion
- Attrition
- Fracture tooth
- Stained tooth
- Hypercementosis
- Complex &Compound Odontomes

Examination of the following gross specimens:

- Papilloma
- Fibroma
- Torus
- Carcinoma of oral structures

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Salivary Gland Tumours

Ameloblastoma

Periapical Granuloma

Dentigerous Cyst

Pulp Polyp

Histopathologic review of:

Peripheral Giant Cell Granuloma

Leukoplakia

Carcinoma in situ

Oral Submucous Fibrosis

Carcinoma of Oral Mucosa

Pleomorphic Adenoma

Malignant Pleomorphic Adenoma

Mucous extravasation cyst

Mucous retention cyst

Warthin's tumour

Adenoid cystic carcinoma

Periapical cyst

Dentigerous Cyst

Odontogenic Keratocyst

Ameloblastoma

Gingival Hyperplasia

ANUG

Lichen Planus

Pemphigus

Dental Caries

ii. Forensic Pathology

Age determination from skull.

Gustafson's method of age determination- using incisors

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15. PUBLIC HEALTH DENTISTRY

a) ***GOAL:***

To prevent and control oral diseases and promote oral health through organized community efforts

b) OBJECTIVES:

i. ***Knowledge:***

At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, palliative care, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy.

ii. ***Skill and Attitude:***

At the conclusion of the course the students shall have acquired the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health and palliative care.

iii. ***Communication abilities:***

At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease.

PALLIATIVE CARE:

Objective of including palliative care in to the curriculum of BDS:

Objective of the curriculum is to train future dental surgeons in the basics of Palliative Medicine. Palliative medicine is the branch of medicine involved in the treatment of patients with advanced, progressive, life-threatening disease for whom the focus of care is maximising their quality of life through expert symptom management, psychological, social and spiritual support as part of a multi-professional team. Government of Kerala has declared palliative care as part of Primary Health Care. Dental surgeons come across many patients with chronic and incurable diseases like cancer, HIV-AIDS etc. Also learning the symptom, control and communication will help them to provide better care to the patients coming under their care.

Structure of the Training:

The palliative care training will be given in the third academic year. The training to include didactic sessions, role plays, discussions, case presentations

Theory*: Introduction (3 hours), Communication (5 hours), Pain management (3 hours), Nursing care (3 hours). Total 14 hours

**Classes in Palliative care to be handled by faculty in Public Health Dentistry who have undergone training in palliative care from KUHS recognised centres.*

1: Introduction to palliative care

Learning Outcomes:

The trainee will be able to discuss the philosophy and definitions of palliative care. The trainee will demonstrate that this knowledge and understanding improves his/ her clinical practice, decision-making and management of practice.

The trainee will demonstrate the knowledge, attitudes and skills required to foster timely and efficient communication between services necessary for a smooth continuum of patient care

The trainee will demonstrate the skilful application of knowledge and understanding to prepare individuals for bereavement, to support the acutely grieving person/family. This will include the ability to anticipate / recognise abnormal grief and access specialist help

The trainee will demonstrate an understanding of the theoretical basis for applied ethics in clinical practice, and be able to evaluate personal attitudes, beliefs and behaviours.

The trainee will demonstrate an awareness of, and respect for, the social and cultural values and practices of others

The trainee will recognise differences in beliefs and personal values. The trainee will be able to deal with conflicts in the beliefs and values within the clinical team. The trainee will recognise the psycho social and spiritual components of problems in advanced diseases and understand the role of non-professional members of the community in addressing them.

Block 1: Philosophy and Principles of palliative care.

Unit 1: Definitions- hospice, palliative care and terminal care, Principles of palliative care. Quality of Life (QOL), concepts of 'Good Death', grief, bereavement team work, inter and multidisciplinary teams. Role of family and community, ethics, spirituality

- Definitions of: palliative care approach; general palliative care; specialist palliative care; hospice; specialist palliative care unit; palliative medicine; supportive care

- Evolving nature of palliative care over the course of illness, including integration with active treatment, and the significance of transition points
- Differing concepts of what constitutes quality of life (including measurement) and a "good death"
- Re-adaptation and rehabilitation
- Shared care with other members of the team and community as a doctor and an individual
- Communication skills relevant to negotiating these roles
- Critical analysis of current theoretical approaches to: medical ethics, including 'four principles (beneficence, non-maleficence, justice and respect for autonomy)
- Understanding the concept of spirituality

2: ***Psychological issues and communication***

Learning Outcomes:

The trainee will demonstrate knowledge and understanding of psychological responses to illness in a range of situations, and skills in assessing and managing these in practice
The trainee will demonstrate good communication skills and use of reflective practice to ensure these skills are maintained.
The trainee will be able to identify obstacles to communication and demonstrate skills in overcoming these.
The trainee will demonstrate a professional attitude to confidentiality

Block 1: Communication.

Unit 1: Communication- Different types, barriers, how to overcome?

Unit 2: Breaking bad news, and handling uncertainty, collusion, denial, anxiety, depression, anger

- Skills in active listening, open questioning and information giving to:
- elicit concerns across physical, psychological, social and spiritual domains
- managing awkward questions and information giving, sensitively and as appropriate to wishes and needs of the individual
- facilitate decision making and promote autonomy of the individual patient
- Ensure that the patient is apprised of arrangements for the continuity of their care and whom to contact in case of need.

- Knowledge of theories and evidence base for communication practice including breaking bad news, collusion and discussing natural death
- Awareness of different styles of communications and critical evaluation of own consulting skills
- Awareness of common barriers to communication for both patients and professionals
- Awareness of common communication problems: deafness, expression and learning disabilities
- A professional understanding of the ethical and legal aspects to confidentiality

Block 2: ***The family in palliative care.***

Unit 1: Terminal/ Chronic illnesses- problems of families.

Unit 2: Coping with the problems - patient to family, family to palliative Care worker, patient to palliative care worker

3: ***Management of pain***

Learning outcomes:

The trainee will have the knowledge, understanding and skills to manage pain in patients with life limiting progressive diseases

Block 1: **Pharmacological Management of pain.**

Unit 1: General considerations, pathophysiology, types and assessment of pain

Unit 2: WHO analgesic ladder

Unit 3: Opioids, nonopioid analgesics and adjuvants in pain management.

Unit 4: Neuropathic pain, diagnosis and management

Unit 5: Other Pains- Breakthrough pain, incident pain, end of dose pain –management

Unit 6: Relevant invasive procedures for pain management.

4: ***Nursing Care***

Learning outcomes:

The trainee will inculcate knowledge and skills required to identify, manage and refer problems in need of specific nursing interventions during the course of palliative care

Block 1: **Mouth care & nutrition**

Unit 1: Management of oral problems in advanced/terminal disease

Unit 2: Nutritional requirements in chronic /terminal disease.

Block 2: Wound care

Unit 1: Prevention and Management of Pressure sores, fungating and Painful ulcers

Unit 2: Management of bleeding from wounds.

c) ***THEORY: 74 HOURS (III yr. 24hrs, Final Yr. Part I. 50 hrs)***

Sl.No.	Topic	No. of hours
1.	Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.	3
2.	**Public Health:**	
	i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics	4
	ii. Public Health: - Definition & Concepts, History of public health	1
	iii. General Epidemiology: - Definition, objectives, methods	3
	iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water, disposal of waste, sanitation, their role in mass disorder	3
	v. Health Education: - Definition, concepts, principles, methods, and health education aids	2
	vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management	1
	vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of, identification in forensic dentistry	3
	viii. Nutrition in oral diseases	1
	ix. Behavioral science: Definition of sociology, anthropology and psychology and their relevance in dental practice and community	3
	x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health	2

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	branches.	
6.	**Palliative Care**	
	i. Introduction	3
	ii. Communication	5
	iii. Pain management	3
	iv. Nursing care	3

d) ***PRACTICALS/CLINICALS/FIELD PROGRAMME IN PUBLIC HEALTH DENTISTRY:***

These exercises designed to help the student in IV and V year:

i. Understand the community aspects of dentistry

ii. To take up leadership role in solving community oral health programme

iii. To gain hands on experience on research methodology

e) PRACTICALS: 200 HOURS (III Yr.60Hrs.Final Yr. Part I 140Hrs.)

Sl.No.	Exercise	No. of hours
1.	**Short term research project:** Epidemiology & Advocacy Purpose: Apply the theory and practice of epidemiology, planning and evaluation, statistics to dental public health. Most of the students are unfamiliar with research and hence this short term project which will be divided across two years (IV and V BDS) would address this issue. Depending on the topic chosen student can incorporate a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels c) Preparation of oral health education material posters, models, slides, lectures, plays acting skits etc. d) Oral health status assessment of the community using indices and WHO basic oral health survey methods e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.	60
2.	**Field visits**	100

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	a) Visit to primary health center-to acquaint with activities and primary health care delivery. b) Visit to water purification plant/public health laboratory/center for treatment of western and sewage water c) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.) d) Visit to institution for the care of handicapped, terminally ill, physically, mentally, or medically compromised patients **Note** : Field visits should have relevance to the short term research project as far as possible Minimum of two visits – one per year (IV and V BDS)	
3.	**Preventive dentistry**: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients.	40
4.	Statistical exercise	

Note: *The colleges are encouraged to involve in the National Service Scheme. programme for students to carry out social work in rural areas.*

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SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Any topic within the syllabus of Public Health Dentistry	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
Any topic within the syllabus of Public Health Dentistry two questions from palliative care	Brief Notes 10x3marks	30
	Total	**70**

iii. Theory

University Written **70 Marks**

Viva Voce **20 Marks**

Internal Assessment **10 Marks**

iv. Clinical:

University Clinical Examination: **80 Marks**

Case history taking *10 Marks*

Assessment of oral health status using any 2 relevant indices *30Marks*

Spotters (Epidemiology, biostatistics, Preventive dentistry, Bioethics) 20Marks

Oral Health Education Talk/ Presentation of oral health education material/Short term student research project presentation /statistical test 15 Marks

Record 5Marks

Internal Assessment: **20 Marks**

Grand Total 200Marks

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16. PERIODONTOLOGY

a) *OBJECTIVES:*

The student shall acquire the skill to:-

i. Perform dental scaling diagnostic tests of periodontal diseases

ii. To use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to:-

i. Impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease

ii. Perform the treatment with full aseptic precautions

iii. Shall develop an attitude to prevent iatrogenic diseases

iv. To conserve the tooth to the maximum possible time by maintaining periodontal health

v. To refer the patients who require specialist's care.

b) *THEORY: 80 HOURS (III yr.30hrs,Final yr. Part I . 50 hrs)*

Topic	Hours
1. Introduction, Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics	1
2. Development of periodontal tissues, Micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction, periodontal ligament, Cementum, Alveolar bone	1
3. Defensive mechanisms in the oral cavity: Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment	1
4. Age changes in teeth and periodontal structures and their association with periodontal diseases and their significance in Geriatric dentistry	1
5. Classification of periodontal diseases: need for classification, Scientific basis of classification, Classification of gingival and periodontal diseases as described in World Workshop1989	1
6. Gingivitis: Plaque associated, ANUG, steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.	1
7. Periodontitis: Adult Periodontitis, rapidly progressive Periodontitis A &B, Juvenile Periodontitis (localized, generalized, and post-juvenile), Prepubertal Periodontitis, Refractory Periodontitis	1
8. Gingival diseases: Localized and generalized gingivitis, Papillary, marginal	7

and diffuse gingivitis aetiology, pathogenesis, clinical signs, symptoms and management of	
a) Plaque associated gingivitis	
b) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)	
c) ANUG	
d) Desquamative gingivitis-Gingivitis associated with Lichen Planus, Pemphigoid, Pemphigus, and other Vesiculobullous lesions	
e) Allergic gingivitis	
f) Infective gingivitis-Herpetic, Bacterial and Candidial	
g) Pericoronitis	
h) Gingival enlargement (classification and differential diagnosis)	
9. Epidemiology of periodontal diseases Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic Classification of indices (Irreversible and reversible), deficiencies of earlier indices used in Periodontics, Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN &CPL, Prevalence of periodontal diseases in India and other countries. Public health significance (All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination.)	**3**
10. Extension of inflammation from Gingiva, mechanism of spread of inflammation from gingival area to deeper periodontal structures, Factors that modify the spread	**1**
11. Pocket ,Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket	**1**
12. Etiology	**5**
a) Dental Plaque (Biofilm), Definition, New concept of Biofilm , Types, composition, bacterial colonization, growth, maturation &disclosing agents, Role of dental plaque in periodontal diseases, Plaque microorganisms in detail and bacteria associated with periodontal diseases, Plaque retentive factors, Materia alba, Food debris	
b) Calculus, Definition, Types, composition, attachment, theories of formation, Role of calculus in disease	

c) Food Impaction, Definition Types, Etiology, Hirschfield's classification, Signs, symptoms & sequelae of treatment	
d) Trauma from occlusion, Definition, Types, Histopathological changes, Role in periodontal disease, Measures of management in brief	
e) Habits, Their periodontal significance, Bruxism & Parafunctional habits, tongue thrusting, lip biting, occupational habits	
f) Iatrogenic factors,	
(i) Conservative Dentistry:-Restorations, Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth	
(ii) Prosthodontics, Interrelationship, Bridges and other prosthesis, Pontics (types), surface contour, relationships of margins to the periodontium, gingival protection theory, muscle action theory& theory of access to oral hygiene.	4
(iii) Orthodontics, Interrelationship, removable appliances & fixed appliances, Retention of plaque, bacterial changes	
g) Systemic diseases, Diabetes, Sex hormones, nutrition (Vit.C& proteins),AIDS & periodontium, Hemorrhagic diseases, Leukemia, clotting factor disorders, PMN 1disorder	1
13. Risk factors, Definition, Risk factors for periodontal diseases	1
14. Host response: Mechanism of initiation and progression of periodontal diseases, Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief, Stages in gingivitis-Initial, early, established & advanced, Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	2
15. Periodontitis:	
a) Etiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult Periodontitis	
b) Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment	5
c) Furcation involvement, Glickman's classification, prognosis and	

management	
d) Rapidly progressive Periodontitis Juvenile Periodontitis: Localized and generalized Post juvenile Periodontitis	
e) Periodontitis associated with systemic diseases ,Refractory Periodontitis	
16. Diagnosis:	
a) Routine procedures, methods of probing, 2 types of probes, (According to case history)	**3**
b) Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	
17. Prognosis, Definition, types, purpose and factors to be taken into consideration	**1**
18. Treatment plan Factors to be considered	**1**
19. Periodontal therapy	
a) General principles of periodontal therapy. Phase I, II, III, IV therapy.	
b) Definition of periodontal regeneration, repair, new attachment and reattachment	
c) Plaque control	**5**
(i) mechanical :tooth brushes, Interdental cleaning aids, dentifrices	
(ii) Chemical: classification and mechanism of action of each & pocket irrigation	
20. Pocket eradication procedures	
a) Scaling and root planning: Indications, Aims & objectives, Healing following root planning, Hand instruments, sonic, ultrasonic & Piezo-electric Scalers	
b) Curettage: Definition Indications present concepts Aims &objectives, Procedures & healing response	**5**
c) Flap surgery: Definition, Types of flaps, Design of flaps, papilla preservation Indications & contraindications, Armamentarium, Surgical procedure & healing response	
21. Osseous Surgery:	
a) Osseous defects in periodontal disease, Definition, Classification	**6**
b) Surgery: resective, additive osseous surgery (osseous grafts with	

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classification of grafts)	
c) Healing responses	
d) Other regenerative procedures; root conditioning	
e) Guided tissue regeneration	
22. Mucogingival surgery & periodontal plastic surgery:	
a) Definition, Mucogingival problems: etiology,	
b) classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins), Indications, objectives	**5**
c) Gingival Augmentation procedures apical and coronal to recession :	
d) Frenectomy, Frenotomy	
e) Crown lengthening procedures	
f) Periodontal microsurgery in brief	
g) Splints: Periodontal splints, Purpose & classification, Principles of splinting	**1**
h) Hypersensitivity, Cause, theories & Management	**1**
i) Implants: Definition, types, scope & biomaterials used, Periodontal considerations: such as Implant-bone interface, Implant-Gingiva interface, Implant failure, Peri-implantitis &management	**1**
23. Maintenance phase (SPT):	
a. Causes, Theories & management	
b. Aims, objectives, and principles	**4**
c. Importance	
d. Procedures	
e. Maintenance of implants	
24. Pharmacotherapy:	
a. Periodontal dressings	**4**
b. Antibiotics & anti-inflammatory drugs	
c. Local drug delivery systems	
25. Periodontal management of medically compromised patients: Topics concerning periodontal management of medically compromised patients	**2**
26. Inter-disciplinary care: Pulpo-Periodontal involvement, Routes of spread of infection, Simons classification, Management	**1**
27. Systemic effects of periodontal diseases in brief: Cardiovascular diseases,	

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Low birth weight babies etc.	
28. Infection control protocol: Sterilization and various aseptic procedures	1
29. Ethics.	1

c) TUTORIALS DURING CLINICAL POSTING:

i. Infection control
ii. Periodontal instruments
iii. Chair position and principles of instrumentation
iv. Maintenance of instruments (sharpening)
v. Ultrasonic, Piezoelectric and sonic scaling - demonstration of technique
vi. Diagnosis of periodontal disease and determination of prognosis
vii. Radiographic interpretation and lab investigations
viii. Motivation of patients- oral hygiene instructions
ix. Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment.
x. Student should perform scaling, root plaining local drug delivery and SPT.
xi. Shall be given demonstration of all periodontal surgical procedures.

d) DEMONSTRATIONS:

i. History taking and clinical examination of the patients
ii. Recording different indices
iii. Methods of using various scaling and surgical instruments
iv. Polishing the teeth
v. Bacterial smear taking
vi. Demonstration to patients about different oral hygiene aids
vii. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
viii. Follow up procedures, post operative care and supervision

e) MINIMUM CLINICAL REQUIREMENTS MANDATORY TO APPEAR FOR UNIVERSITY EXAMINATION:

i. Diagnosis, treatment planning, and discussion and total periodontal treatment- 10 cases (5 Long cases + 5 Short Cases)
ii. Supra gingival scaling 50 complete cases (including minimum 2 ultrasonic scaling) and oral hygiene instructions –
iii. Sub gingival Scaling and Root Plaining - 10 cases

iv. Assistance in periodontal surgery- 2 cases

v. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

vi. Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Periodontology Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

v. Theory

University Written	**70 Marks**
Viva Voce	**20 Marks**
Internal Assessment	**10 Marks**

vi. Clinical:

University Clinical Examination:	**80 Marks**
Case History, Clinical Examination, Diagnosis & Treatment Planning	30*Marks*
Oral prophylaxis	30 Marks
Clinical Work Record & Seminar	20 *Marks*
Internal Assessment:	**20 Marks**
	Grand Total 200Marks

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17. ORAL MEDICINE AND RADIOLOGY

a) AIM

i. To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.

ii. To train the students about the importance, role, use and techniques of radiographs and other imaging methods in diagnosis.

iii. The principles of the clinical and radiographic aspects of Forensic Odontology.

b) COURSE CONTENT

i. The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.

Part-I: Diagnosis, Diagnostic methods and Oral Medicine {which is again subdivided into three sections. (a) Diagnostic methods (b) Diagnosis and differential diagnosis (c) Oral Medicine & Therapeutics} and Part-II: Oral Radiology. Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.

ii. To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

c) THEORY: 75 HOURS (III YR. 25 HRS, FINAL YR. PART. I. 50 HRS.)

	THEORY TOPICS FOR THIRD YEAR (25 Hrs)	
Sl No	**Oral Medicine Topics**	**Hours**
1.	Introduction to oral medicine, terminologies & Ethics (Professional liabilities, negligence, malpractice, consent etc)	1
2.	Case history and clinical examination (examination of soft tissues and hard tissues, primary & secondary lesions, lymph nodes, TMJ, muscles of mastication, salivary glands, swelling, ulcer, white & red lesions, pigmented lesions)	2
3.	Lymphatic drainage of head and neck. D/d of cervical lymphadenopathy	1
4.	Investigations in oral medicine (chair side and laboratory investigations including haematological, microbiological, immunologic, biochemical and biopsy).	2
5.	Dental therapeutics (drugs commonly used: antibiotics, anti-inflammatory, analgesics, anaesthetics, steroids, topical applications, coagulants &anticoagulants, sialogogues).	2
6.	Emergencies in dental practice	1
7.	Developmental disorders of the teeth & paradental structures	1
8.	Acute and chronic infections of the jaws (sequalae of dental infection, spread of infection, facial space infections, osteomyelitis, foci of oral infections)	1
9.	Disorders of tongue	1
Total Oral Medicine teaching hours in third year		**12**
	Radiology Topics	
1.	History of dental radiology, Radiation Physics (electromagnetic spectrum, properties of X rays)	1

2.	Construction and working of x-ray tube, production of X-rays, factors controlling x-ray beam, interaction of x-rays with matter	2
3.	Radiation biology.	1
4.	Radiation protection.	1
5.	Films used in dental radiology, grids and intensifying screen	1
6.	Intraoral radiographic techniques (periapical, bitewing, occlusal & localization techniques).	2
7.	Processing of X-ray films.	1
8.	Qualities of an ideal radiograph.	1
9.	Infection control and Quality assurance in Dental Radiology	1
10.	Radiographic normal anatomical landmarks.	2
Total Radiology teaching hours in third year		**13**
	THEORY TOPICS FOR FINAL YEAR PART I (50 Hrs)	
Sl	**Oral Medicine Topics**	**Hours**
1.	Oro Facial pain (Classification, differential diagnosis & management)	2
2.	White & Red lesions (classification, differential diagnosis and Management).	2
3.	Vesiculobullous & Ulcerative lesions (classification, differential diagnosis, management, a	2
4.	Bacterial (Bacterial, Viral & Fungal infections)	1
5.	Viral Infections of oral and paraoral structures	2
6.	Fungal Infections of oral and paraoral structures	1
7.	Granulomatous diseases affecting orofacial region	1
8.	Nutritional deficiencies (Vitamins, Minerals)	1
9.	Pigmented lesions affecting oral mucosa (exogenous & endogenous, differential	1
10	RBC &WBC disorders (oral manifestations & dental considerations)	2
11	Bleeding & Clotting disorders (Oral manifestations & Dental considerations)	1
12	System review in oral medicine - Endocrine (Pituitary, thyroid, Parathyroid, Adrenal,	1
13	System review in oral medicine - CVS (oral manifestation & dental considerations)	1
14	System review in oral medicine - CNS , GIT & Respiratory System (oral	2
15	System review in oral medicine - Renal System (oral manifestation & dental	1
16	Saliva as a diagnostic tool and salivary gland disorders (developmental, functional,	2
17	TMJ disorders (classification, developmental disorders, degenerative disorders, disc	1
18	Benign & malignant non - odontogenic tumors of the orofacial region (epithelial,	1
19	Fibroosseous lesions of jaws	1
20	Cysts & of orofacial region (Odontogenic & Non Odontogenic).	1
21	Odontogenic Tumors	1
22	Oral Cancer (Etiology, pathogenesis, clinical features, Diagnosis, management &	2
23	Forensic odontology	2
Total Oral Medicine teaching hours in final year part I		**33**
	Radiology Topics	
1.	Principles of radiographic interpretation.	1
2.	Faulty radiographs :- Causes and rectification	1
3.	Role of radiography in diagnosis of dental caries & periodontal disease.	1
4.	Periapical radiolucencies & Generalized rarefactions of jaws	1
5.	Pericoronal radiolucencies	1
6.	Multilocular radiolucencies	1

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7.	Radiopacities in jaws	1
8.	Mixed radiopaque - radiolucent lesions of jaws.	1
9.	Panoramic Radiography	1
10	Extra oral radiography &Imaging of maxillary sinus	1
11	TMJ radiography & Radiographic features of the diseases of TMJ.	1
12	Salivary gland imaging & Radiographic features of the diseases of salivary glands	1
13	Radiography of traumatized teeth & jaws	1
14	Contrast radiography, Radioisotopes & Scintigraphy	1
15	Digital radiography.	1
16	Recent imaging modalities and its application in dentistry (CT, CBCT, MRI & USG)	1
17	Role of radiographs in Forensic odontology	1
Total Radiology teaching hours in Final year Part I		**17**

d) CLINICALS:

1. Training in:
   - Patient examination
   - Patient assessment
   - Treatment planning
   - Medications if any, with dose
   - Follow up protocols
2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination.
3. The minimum clinical requirement to appear for University examination is listed below:

Minimum clinical and academic requirements (Year wise split up)

Third Year

Sl No	Procedure	Minimum requirement
1	Short cases (routine OP)	40
2	Observation of specialty cases in the PG Clinic	5
3	Observation of minor surgical procedures	2
4	*Seminar on basic topics	1

Final year Part I

Sl No	Procedure	Minimum requirement
1	Short cases (routine OP)	60
2	Long Cases	10
3	Assisting minor surgical procedures	2
4	Taking & interpretation of IOPA radiographs	20
5	Taking & interpretation of Bitewing radiographs	2
6	Taking & interpretation of Occlusal radiographs	2
7	Observation of Specialized imaging modalities like panoramic & skull radiographs, CBCT, USG etc…	4
8	Seminars	2 (One Oral Medicine & One Radiology topic)

e) *SCHEME OF EXAMINATION*

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One question from oral medicine and one from radiology	Structured Essays 2x 10marks	20
A. Diagnostic Methods – Two questions B. Differntial Diagnosis - two questions C. Therapuetics– Two question D. Radiation Physics – One question E. Techniques – Two Questions F. Radiographic Interpretation – One Question	Short Notes 4 x 5marks	20
A. Four Questions from Oral Medicne B. Four Questions from Radiology C. Two from Forensic Odontology	Brief Notes 10x3marks	30
	Total	**70**

vii. *Theory*

University Written	**70 Marks**
Viva Voce	**20 Marks**
Internal Assessment	**10 Marks**

viii. *Clinical:*

University Clinical Examination:		**80 Marks**
Spotters (1 mark each)	*1x 10*	*10 Marks*
Discussion Long Case	*1x30*	*30 Marks*
Taking and Interpretation of Radiograph	*1x30*	*30 Marks*
Work Record and seminar		*10 Marks*
Internal Assessment:		**20 Marks**
		Grand Total 200 marks

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18. ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

a) *AIM*

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyze and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures

b) *COURSE CONTENT*

The undergraduate study of orthodontics spans over second year, third year and fourth year. In second year the emphasis is given for basic and preclinical wire bending exercises and appliance fabrication. In third year the student has to undergo clinical postings where patient care and appliance management is emphasized. In fourth year of study the candidate will be allotted with long cases for detailed discussion treatment plan formulation appliance construction, insertion and management. In addition they will be trained to attend routine out patients, appliance activation, cephalometric interpretation etc.

c) *SKILLS*

i. To diagnose a case of malocclusion and formulate a treatment plan
ii. To make a good alginate impression
iii. To fabricate a good study model
iv. To perform various model analysis and cephalometric analysis
v. To construct routine removable and myofunctional appliances using cold cure acrylic
vi. Insertion and management of appliance

d) *INTEGRATION*

By learning the science of Orthodontics, the student should be able to diagnose different types of malocclusion, develop a treatment plan and manage simple malocclusions. The student should acquire skills to recognize Complex malocclusions and the same may be referred to a specialist.

This insight is gained in a variety of ways:

i. Pre clinical training
ii. Lectures & small group teaching
iii. Demonstrations
iv. Spot diagnosis and discussions
v. Long case discussions
vi. Seminar presentations

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e) *AN OUTLINE OF THE COURSE CONTENT:*

Study of clinical Orthodontics to enable the student to understand the science and art of orthodontics

f) *THEORY: 70 Hours (III yr. 20hrs, Final yr. Part. I. 50 Hrs)*

Sl no	Topics for III year	Hours
1	Introduction definition historical background aims and objectives of orthodontics and need for orthodontic care	1
2	Growth and development –General principles. Definition, growth spurts and differential growth, factors influencing growth and development, methods of measuring growth, Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovic's, Multifactorial) 1.Genetic and epigenetic factors in growth 2. Cephalocaudal gradient in growth. 3.Morphologic Development Of Craniofacial Structures a. Methods of bone growth b. Prenatal growth of craniofacial structures c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion. 4. Functional Development of Dental Arches and Occlusion a. Factors influencing functional development of dental arches and occlusion. b. Forces of occlusion c. Wolfe's law of transformation of bone d. Trajectories of forces 5. Clinical Application Of Growth And Development Normal And Abnormal Function Of Stomatognathic System	7
3	Occlusion and Malocclusion in general a. Concept of normal occlusion b. Definition of malocclusion c. Description of different types of dental, skeletal and functional malocclusion. Classification of Malocclusion	4

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	Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.	
4	Etiology of malocclusion a. Definition, importance, classification, local and general etiological factors. b. Etiology of various types of malocclusion.	2
5	Diagnosis And Diagnostic Aids a. Definition, Importance and classification of diagnostic aids b. Importance of case history and clinical examination in orthodontics c. Study Models: - Importance and uses - Preparation and preservation of study models d. Importance of intraoral X-rays in orthodontics e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses f) Cephalometrics: Its advantages, disadvantages 1. Definition 2. Description and use of cephalostat 3. Description and uses of anatomical landmarks lines and angles used in Cephalometric analysis 4. Analysis- Steiner's, Down's, Tweed's, Witts, Ricket's-E- line g. Electromyography and its uses in orthodontics h. Wrist X-rays and its importance in orthodontics	5
	Topics for Final year (Part I)	
1	Preventive orthodontics Definition and Different procedures undertaken in preventive orthodontics and their limitations	2
2	Interceptive orthodontics a. Definition b. Different procedures undertaken in interceptive orthodontics c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages. d. Role of muscle exercises as an interceptive procedure	3
3	General principles in orthodontic treatment planning	

4	Anchorage Anchorage in Orthodontics- Definition, Classification, Types and Stability Of Anchorage	2
5	Biomechanical principles in orthodontic Tooth Movement a. Different types of tooth movements b. Age factor in orthodontic tooth movement	2
6	Biology of tooth movement Tissue response to orthodontic force application	2
7	Methods of gaining space Proximal stripping Extractions Expansions Distalisation Proclination of anteriors and de-rotation of posteriors	7
8	Orthodontic appliances – general Indications, classifications, advantages and disadvantages	2
9	Removable orthodontic appliances Components, indications, advantages and disadvantages	2
10	Fixed orthodontic appliances Historical development, various systems, components, advantages disadvantages.	2
11	Myo functional appliances Definition, classification, various appliances like activator, Frankel, Twinblock, bionator and fixed functional appliances	5
12	Orthopaedic appliances Head gear, face mask and chin cap	3
13	Cleft lip and palate – orthodontic management	2
14	Surgical orthodontics – general Minor surgical procedures Major surgical procedures Surgical decompensation	3
15	Principles of management of various malocclusions Deep bite, open bite, cross bites, midline diastema, class I, II and III malocclusion	3

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16	Adult orthodontics	2
17	Retention and relapse Schools of thought, theorems of retention, various fixed and removable retainers	2
18	Computers and recent developments in orthodontics	2
19	Genetics	1
20	Ethics	1
21	Miscellaneous topics a) Soldering and welding b) Sterilization c) Laboratory procedures.	1

g) *CLINICAL TRAINING*

Sl no	Training In III year	Hours
1	Model analysis • Pont's analysis • Ashley Howe's analysis • Carey's analysis • Bolton's analysis • Moyer's mixed dentition analysis	60
2	Cephalometric analysis • Down's analysis • Steiner's analysis • Tweed's analysis • Witts appraisal	
	Short cases	
3	• Impressions • Model fabrication • Wire bending • Acrylization • Trimming and polishing • Insertion of appliance	
	Training In Final year (Part I)	
1	Long case taking • Case taking	140

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	• Model analysis • Discussion • Appliance fabrication and insertion	
2	Short cases • Spot diagnosis and spot discussion • Appliance fabrication and insertion	
3	Attending O P cases and appliance review	
4	Desirable exercises Modified Adam's clasp Adams clasp on anterior teeth Split labial bow, reverse labial bow, mills retractor, Roberts retractor, high labial bow with aprons spring	

h) *SCHEME OF EXAMINATION*

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Growth and development, classification and etiology of malocclusion, diagnostic aids, interceptive orthodontics, anchorage, biomechanics, biology of tooth movement, methods of gaining space, myofunctional appliances, orthopaedic appliances, retention and relapse	Structured Essays 2x 10marks	20
Introduction and historical background, growth and development, occlusion and malocclusion – classification and etiology. Diagnostic aids, skeletal maturity indicators, preventive and interceptive orthodontics, general principles of treatment planning, anchorage, biomechanics, biology of tooth movement, methods of gaining space, orthodontic appliances – removable and fixed appliances, myo-functional and orthopaedic appliances, management of various malocclusions, management of cleft lip and palate, surgical orthodontics, adult orthodontics, retention and relapse, computers in orthodontics, genetics and ethics.	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

ix. Theory

University Written	70 Marks
Viva Voce	20Marks
Internal Assessment	10 Marks

x. Clinical:

University Clinical Examination:	**80 Marks**
Case Presentation	*40Marks*
Impression Making	*20 Marks*
Spotters (10 x 1 Marks)	10 Marks
Clinical Work Record/Seminar/Assignment	*10 Marks*
Internal Assessment:	**20 Marks**
	Grand Total 200Marks

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19. ORAL & MAXILLOFACIAL SURGERY

a) AIM

To produce a graduate who is competent in performing extraction of teeth and minor surgeries under both local and general anaesthesia, prevent and manage related complications, acquire knowledge regarding aseptic procedures, have reasonable understanding of management of infectious patients and prevention of cross infections, learn about BLS, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems and also to acquire reasonable knowledge regarding the surgical principals involved in implant placement and be able to communicate properly and understand medico legal responsibilities

b) OBJECTIVES:

i. Knowledge & Understanding

At the end of the course and the clinical training the graduate is expected to –

(1) Able to apply the knowledge gained in the preclinical subjects and related medical subjects like general surgery and general medicine in the management of patients with oral surgical problem.

(2) Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.

(3) Knowledge of range of surgical treatments.

(4) Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.

(5) Understand the principles of in-patient management.

(6) Understand the principles of emergency management of maxillofacial injuries, BLS measures and the medico legal responsibilities and formalities.

(7) Understanding of the management of major oral surgical procedures and principles involved in patient management.

(8) Be able to decide the need for medical/ surgical consultations and the method of doing so.

(9) Should know ethical issues and have communication ability.

(10) Should know the common systemic and local diseases, drugs used and drug interactions

(11) Death Certification & legal aspects of forensic medicine

ii. Skills:

A graduate should have acquired the skill to:

(1) Examine any patient with an oral surgical problem in an orderly manner.

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(2) Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.

(3) Should be competent in the extraction of teeth under both local and general anesthesia.

(4) Should be able to carry out certain minor oral surgical procedures under L.A. simple impactions, draining of abscesses, simple dental wiring, biopsies etc.

(5) Ability to assess, prevent and manage various complications during and after surgery.

(6) Able to provide primary care and manage medical emergencies in the dental office.

(7) Understanding of the management of major oral surgical problems and principles involved in inpatient management.

(8) Should be competent in measures necessary for homeostasis and wound closures.

c) THEORY: 70 HOURS (III Yr. 26 hrs, Final Yr. Part I. 20 hrs. Part II. 30 hrs.)

Sl. No.	Topics	Description	Hours
		Topics for III Year	
1.	Introduction	Definition, scope, aims and objectives. Diagnosis in oral surgery: History taking, Clinical examination, Investigations. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.	1
2.	Principles of Oral Surgery	1) Asepsis: Definition Measures to prevent introduction of infection during Surgery. Preparation of the patient, Measures to be taken by operator, Sterilization of instruments - various methods of sterilization etc, Principles and need for cleaning of infected/ used instruments prior to re sterilization Surgery set up. 2) Painless Surgery:	4

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		Pre- anesthetic considerations Pre-medication: purpose, drugs used Anesthetic considerations a) Local b) Local with IV sedations Use of general anesthetic 3) Access: Intra-oral: Mucoperiosteal flaps, principles, commonly used intraoral incisions. Bone Removal: Methods of bone removal. Use of Burs: Advantages & precautions Bone cutting instruments: Principles of using chisel & osteotome. Extra-oral. Skin *incisions - principles, various extra-oral incision to expose facial* skeleton. a) Submandibular b) Pre auricular Incision for TMJ, Access to maxilla & orbit , Bi coronal incision 4) Control of hemorrhage during surgery Normal Haemostasis Local measures available to control bleeding Hypotensive anaesthesia etc. 5) Drainage & Debridement Purpose of drainage in surgical wounds Types of drains used Debridement: purpose, soft tissue & bone debridement. 6) Closure of wounds Type wounds, Classification of wounds Suturing: Principles Suture material: Classification, ideal requirements Body response and resorbability of	

		various materials etc. 7) Post operative care Post operative instructions Physiology of cold and heat in the control of pain and swelling Analgesics and anti-inflammatory drugs in the control of pain and swelling Control of infection – antibiotics, principles of antibiotic therapy, prevention of antibiotic abuse Long term post operative follow up - significance.	
3.	Local Anaesthesia	Introduction and Neurophysiology Concept of LA Classification of local anesthetic agents Ideal requirements, Mechanism of action, Armamentarium required Types of local anaesthesia Use of vaso constrictors in local anesthetic solution -Advantages, contra-indications, Various vaso constrictors used. Anaesthesia of the mandible -Pterygomandibular space - boundaries, contents etc. Intra oral and extra oral techniques of Inferior Alveolar Nerve Block, Mandibular Nerve Block, Mental Nerve Block, Infiltrations, etc. Anaesthesia of Maxilla – Infiltrations, Infra - orbital nerve block, Posterior superior alveolar nerve block, Infiltrations, Maxillary nerve block – Intra oral and extra oral Techniques Complications of local anaesthesia- local and systemic Disposal of sharp instruments	5

4.	General Anaesthesia	Concept of general anaesthesia. Indications of general anaesthesia in dentistry. Pre-anesthetic evaluation of the patient. Pre-anesthetic medication - advantages, drugs used. Conscious sedation Commonly used anesthetic *agents.* Complication during and after G.A. I.V. sedation with Diazepam and Midazolam. Indications, mode of action, technique etc. Cardiopulmonary resuscitation Use of oxygen and emergency drugs. Tracheostomy.	2
5.	Exodontia	General considerations Ideal Extraction. Indications/ contra indications for extraction of teeth Extractions in medically compromised patients. Methods of extraction Forceps or intra-alveolar or closed method. Principles, types of movement, force, role of left hand etc. Trans-alveolar, surgical or open method Indications, surgical procedure. Dental elevators, uses, classification, principles in the use of elevators, commonly used elevators. Armamentarium, Complications Complications during exodontia Common to both maxilla and mandible. Post-operative complications Prevention and management of complications.	4
6.	Medical Emergencies in dental practice	Primary care of medical emergencies in dental practice (a) Cardio vascular (b) Respiratory (c) Endocrine	3

		(d) Anaphylactic reaction (e) Epilepsy Basic Life Support	
7.	Emergency drugs & Intra muscular and I.V. Injections	Emergency drugs required in a dental clinic Applied anatomy. Sites for intra muscular and intra venous injections, techniques etc.	1
8.	Death Certification & legal aspects of Forensic medicine.(*classes to be handled by faculty from the department of forensic medicine of a recognized medical college)**	Legal procedure and courts	1
		Medicolegal Autopsy, Objective, Procedure - Exhumation	2
		Sudden and unexpected death	1
		Forensic traumatology -Mechanical injuries, Medicolegal aspect of injury, Head injury, Transportation injuries	1
		Dental investigation in mass disaster incidents	1
		Topics for Final year (Part I)	
9.	Impacted teeth	i. Incidence, definition, etiology. ii. Impacted mandibular third molar Classification, reasons for removal Assessment - both clinical & radiological. Armamentarium and surgical procedures for removal. Complications during and after removal, its prevention and management. iii. Maxillary third molar, Indications for removal, classification, Armamentarium and surgical procedure for removal, Complications during and after removal, its prevention and management. iv. Impacted maxillary canine. Reasons for canine impaction, indications for removal, Methods of management, Localization, labial and palatal approaches, Complications during and	4

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		after removal, its prevention and management Surgical exposure,Transplantation	
10.	Neurological Diseases	i. Trigeminal neuralgia - definition, etiology, clinical features and methods of management including medical and surgical. ii. Facial paralysis - etiology, clinical features. iii. Nerve injuries - Classification, clinical features and management, Nerve Grafting -Neuropathy etc.	3
11.	Implants	Concept of osseointegration, History of implants their design & surface characteristics. Knowledge of various types of implants, Bone biology, Morphology, Classification of bone and its relevance to implant placement. Bone augmentation materials. Soft tissue considerations in implant dentistry. Surgical procedure to place implants.	2
12.	Diseases of the maxillary sinus	Surgical anatomy and development of the sinus. Sinusitis both acute and chronic Surgical approach of sinus - Cald well-Luc procedure, Knowledge of FESS, Removal of root from the sinus. Oro-antral fistula and communications- etiology, clinical features and surgical methods for closure.	2
13.	Cysts of the mouth and jaws	Definition, classification, pathogenesis. Diagnosis - Clinical features, radiological, FNAC, use of contrast media and histopathology. Management - types of surgical procedures. Rationale of the techniques, indications, contraindications, procedures, complications etc.	4
14.	Jaw deformities	Basic forms - Prognathism, Retrognathism and open bite. Reasons for correction.	3

		Diagnosis and treatment planning Outline of surgical methods carried out on mandible and maxilla-subapical, body,sagittal split osteotomy, genioplasty, anterior maxillary Osteotomy, Le fort I osteotomy Role of distraction osteogenesis in correction of jaw deformities	
15.	Pre-prosthetic Surgery	Definition Classification of procedures Corrective procedures: Alveoloplasty, Reduction of maxillary tuberosities, Frenectemies and removal of tori. Ridge extension or Sulcus extension procedures, Indications and various surgical procedures Ridge augmentation and reconstruction. Indications, use of bone grafts, hydroxyapatite etc	**2**
		Topics for Final year (Part II)	
16.	Cleft Lip and Palate	Etiology of the clefts, incidence, classification Role of dental surgeon/ maxillofacial surgeon in the cleft team. Outline of the closure procedures,	**1**
17.	Infections of the Oral cavity	Introduction, surgical anatomy of the superficial and deep fasciae of head and neck Factors responsible for infection, pathogenecity, virulence Dento-alveolar abscess - aetiology, clinical features and management. Spread of odontogenic infections through various facial spaces and its management Ludwig's angina - definition, aetiology, clinical features, management and complications Course of odontogenic infections	**6**
18.	Fungal Infections of head and neck	Candidiasis, Actinomycosis, Coccidiodmycosis, Rhinosporidosis.	**1**

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	region	Antifungal agents	
19.	Osteomyelitis of the jaws	Definition, etiology, pre-disposing factors, classification, clinical features and management.	1
20.	Carcinoma of the oral cavity	Lymphatic Spread. TNM classification, Staging. Biopsy-types, filling of Histopathology request form Outline of management of Squamous Cell Carcinoma: surgery, radiation and chemotherapy Role of dental surgeons in the prevention and early detection of oral cancer.	2
21.	Osteoradionecrosis -	Definition, etiology, theories, pre-disposing factors, classification, clinical features and management.	1
22.	Maxillofacial Traumatology	Emergency management in maxillofacial trauma General considerations, types of fractures, aetiology, clinical features and general principles of management. Mandibular fractures - Applied anatomy, classification. Diagnosis - Clinical and radiological features, Management - Reduction -closed and open Fixation and immobilization methods outline of rigid and semi-rigid internal fixation Fractures of the condyle - etiology, classification, clinical features, principles of management Fractures of the middle third of the face. Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management. Alveolar fractures - methods of management Fractures of the Zygomatic complex and orbit. Classification, clinical features, indications for treatment, various methods of reduction and fixation	7

		Faciomaxillary Injuries in Children Complications of fractures - delayed union, non-union and malunion.	
23.	Salivary gland diseases	Surgical Anatomy of Minor and Major salivary glands Sialography, contrast media, procedure. Inflammatory conditions of the salivary glands Sialolithiasis- Sub mandibular duct and gland , parotid duct and gland ,Clinical features, management, Intraoral and extra oral Sialolithotomy. Salivary fistulae, sialocoele Autoimmune diseases of the salivary glands, diagnosis management Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.	3
24.	Tumors of the Oral cavity	General considerations, surgical principles Non odontogenic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, myxoma etc. Odontogenic tumors: both benign and malignant. Ameloblastoma - Clinical features, radiological appearance and methods of management. Osteogenic tumours of the faciomaxiliary region.	4
25.	Disorders of T.M. Joint	Applied surgical anatomy of the joint. Development of the TMJ Surgical approaches to TM.J Radiological investigations Hypermobilty of TMJ; Dislocation - Types, aetiology, clinical features and management. Hypomobility of TMJ; Classification, Ankylosis - Definition, aetiology, clinical features and management	4

		Myo-facial pain dysfunction syndrome, etiology, clinical features, management- Non surgical and surgical. Internal derangement of the joint. Inflammatory Diseases of T.M. Joint. Arthroscopy	

d) CLINICAL AND ACADEMIC REQUIREMENTS

i. Case Taking: Detailed clinical examinations, investigations and diagnosis – 10 nos.

ii. Dental extractions under local anesthesia – 180 nos.

iii. Suturing of extraction wound -5 nos.

iv. Incision and drainage – 3 nos.

v. Arch bar wiring, eyelet wiring and intermaxillary fixation on plaster or acrylic models- 1 each

vi. IV/ IM injection technique on patients- 5 nos. each

vii. Wound dressing – 5 nos.

viii. Observing minor surgery done by staff member- 5 nos.

ix. Surgical Assistance of minor surgeries- 5 nos.

x. Observation of major surgeries in Operation Theatre- 3 nos.

xi. Observation of surgical procedures performed in casualty– 5 nos.

xii. Training in handling medical emergencies. CPR and basic life support

xiii. Seminars: 6 nos. Two in the third year, Two in the fourth year and Two in the final year

A work record should be maintained by all students detailing each of the clinical and academic requirements duly signed by the teacher in charge and should be submitted at the time of examination after due certification from the head of the department.

e) CLINICAL REQUIREMENTS YEAR WISE SPILT UP:

Sl. No.	Topic	Procedures in III Year	Quota: Must do
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	2 cases
2	Dental Extraction	Extraction of anterior and mobile teeth under LA : Infiltration only	30 cases
3	Seminars	Seminars on basic subjects, local anesthesia, investigative procedures,	2 no.

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		exodontia etc	
	Injection	IV/ IM injection technique on patients-	5nos.each
4	Observation	Observing minor surgery under LA done by staff member	2 cases
Procedures in Final year (Part I)			
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	3 cases
2	Dental Extraction	Extraction of anterior and posterior teeth under LA : Infiltration and blocks	90 cases
3	Suturing	Suturing of extraction wound	5 no.
4	Seminars	Seminars on oral surgery subjects, cross contamination and infection, impactions, medically compromised patients, medical emergencies etc.	2 no.
5	Observation	Observing minor surgery under LA done by staff member	3 cases
6	Assistance	Assistance of minor surgery under LA done by staff member	2 cases
7	Observation	Observation of cases managed in the casualty	2 cases
8	Skill development	Wiring procedures in models	3 nos.
Procedures in Final year (Part II)			
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	5 cases
2	Dental Extraction	Extraction of anterior and posterior teeth under LA : Infiltration and blocks	60cases
3	Seminars	Seminars on oral surgery subjects like TMJ, Tumors, Maxillofacial injuries, Infections, Salivary Gland diseases and Medico-legal cosiderations	2 no.
4	Observation	Observation of major surgery under GA do in the OT	3 cases
5	Assistance	Assistance of minor surgery under LA done	3cases

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		by staff member	
6	Procedure	Incision and drainage	3
7	Procedure	Wound dressing	5
8	Observation	Observation of cases managed in the casualty	3 cases

f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question from Local Anaesthesia One Question from Oral Surgery	Structured Essays 2x 10marks	20
Two Questions from Oral Surgery, One Question from Local Anaesthesia, , One Question from General Anaesthesia	Short Notes 4 x 5marks	20
Questions from any of the Oral & Maxillofacial Surgery topics.(at least one question from management of medical emergencies) One question from Death Certification & legal aspects of Forensic medicine.	Brief Notes 10x3marks	30
	Total	**70**

xi. ***Theory***

University Written — **70Marks**

Viva Voce — **20Marks**

Internal Assessment — **10 Marks**

xii. ***Clinical:***

University Clinical Examination: — **80 Marks**

Extraction of one firm tooth (Maxillary/ Mandibular)

Case History	*20 Marks*
Local Anaesthesia technique	*25 Marks*
Extraction of firm tooth & patient management	25 Marks
Clinical Work Record & Seminar	*10 Marks*

Internal Assessment: — **20 Marks**

Grand Total 200Marks

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20. CONSERVATIVE DENTISTRY AND ENDODONTICS

a) OBJECTIVES:

i. ***Knowledge and Under Standing:***

The graduate should acquire the following knowledge during the period of training,

(1) To diagnose and treat simple restorative work for teeth.

(2) To gain knowledge about aesthetic restorative material and to translate the same to patients needs.

(3) To gain the knowledge about endodontic treatment on the basis of scientific foundation.

(4) To carry out simple endodontic treatment.

(5) To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

ii. **Skills:**

He should attain following skills necessary for practice of dentistry

(1) To use medium and high speed hand pieces to carry out restorative work.

(2) Poses the skills to use and familiarize endodontic instruments and materials needed for carrying out simple endodontic treatment.

(3) To achieve the skills to translate patients esthetic needs along with function.

iii. ***Attitudes:***

(1) Maintain a high standard of professional ethics &conduct and apply these in all aspects of professional life.

(2) Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.

(3) To help and participate in the implementation of the national oral health policy.

(4) He should be able to motivate the patient for proper dental treatment and maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

b) THEORY: 160 HOURS (II yr.25hrs, III Yr. 65 hrs, Final Yr. Part I. 40 hrs. Part II. 30hrs.)

Sl.No.	Topic for II Year	Hours
1.	Introduction to Conservative Dentistry.	1
2.	Definition, Aim & Scope of Conservative Dentistry & Endodontics	
3.	Nomenclature of dentition; Tooth Numbering systems	1
4.	Restoration - Definition & Objectives	

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5.	Hand Instruments - Classification, Nomenclature, Design, Formula of hand cutting instruments, Grasps and Rests, Sterilization.	2
6.	Rotary Cutting instruments - Burs, Design, Types. Various speeds in tooth preparation. Hazards with cutting instruments.	2
7.	Dental caries – Aetiology, classification, caries terminology	1
8.	Fundamentals in Tooth preparation	4
9.	Definition, Stages and steps , Classification of Tooth preparations, Nomenclature, Concepts in tooth preparations for Silver Amalgam, Cast gold inlay, Composite resins and Glass Ionomer	
10.	Tooth preparation for amalgam restorations. Stepwise procedure for Class I, II, III, IV, V amalgam restorations. Failure of amalgam restoration.	6
11.	Contact and contour of teeth – different methods of tooth separation	1
12.	Matrices, Retainers, Wedges – methods of wedging	1
13.	Finishing & polishing of restorations.	1
14.	Chair side positions – patient and operator positions	1
15.	Management of deep carious lesions – Technique of caries excavation with hand and rotary instruments, Affected and Infected dentin, Caries detector dyes, Concept of Remaining Dentin Thickness, Pulp capping and Pulpotomy.	2
16.	Access cavity and brief introduction of root canal instruments	2
	Topic for III Year	
17.	**Nomenclature of Dentition** Tooth numbering systems: ADA, Zsigmondy- Palmer, and FDI systems	2
18.	**Gnathological concepts of Restoration** Physiology of occlusion, normal occlusion, ideal occlusion mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.	3
19.	**Dental Caries** Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries. Caries treatment.	6
20.	**Treatment Planning For Restorative Procedure:** Patient assessment, clinical examination, radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet. Patient and operator position.	3
21.	**Preventive measures in restorative practice** Plaque control, Pit and Fissure sealants, Fluorides, Dietary measures, restorative	4

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	procedures and periodontal health.	
22.	**Armamentarium for Tooth Preparation:** General classification of operative instruments. a) Hand cutting instruments Terminology and classification Design, formula and sharpening of instruments. Grasp Rest and application. b) Rotary cutting instruments Dental bur , mechanism of cutting Common design characteristics Diamond and other abrasive instruments Cutting mechanism Hazards and precautions Sterilization and maintenance of instruments. Basic Instrument tray set up.	6
23.	**Isolation of Operating Filed:** Control of moisture ,purpose and methods of isolation, rubber dam isolation in detail, antisialogogues	3
24.	**Infection Control** Routes of transmission of dental infection Personal barrier protection Control of infection from aerosol, spatter Sterilization procedures for dental equipment and instruments, monitoring sterilization, disinfection of operatory Dental water line contamination and Biofilm Disposal of waste	4
25.	**Pulp Protection** Liners, Varnishes, Bases. Affected and infected dentin, Caries detector dyes Concepts of Remaining Dentin Thickness	3
26.	**Pain control in restorative procedures**	3
27.	**Amalgam Restoration:** Indication, contraindication. Physical and mechanical properties	7

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	Clinical behavior. Advantages and disadvantages. Tooth preparation for Class I , II, V and III. Step wise procedure for tooth preparation and restoration including modified designs. Bonded amalgam, Failure and repair of amalgam restorations	
28.	**Contacts and contour** Tooth separation Matrices, retainers and wedges, methods of wedging	1
29.	**Management Of Deep Carious Lesions** Technique of caries excavation – Hand and rotary Indirect and Direct Pulp Capping, Pulpotomy	1
30.	**Dentinal Hypersensitivity** Theories of hypersensitivity Management	1
31.	**Complex amalgam restorations** Pin Amalgam Restoration Indications, Contra Indication, Advantages, Disadvantages of pin amalgams, types of pins, methods of placement, alternative means for providing retention for complex amalgam restorations. Failure of pin amalgam restoration	4
32.	**Gingival Tissue Management** Indication and methods, including recent techniques for gingival retraction.	2
33.	**Adhesion to tooth structure** Definition and mechanism Enamel and Dentin bonding Classification and recent development in dentin bonding systems components of dentin bonding agents critical steps in dentin bonding.	3
34.	**Anterior Restorations** Selection of cases, selection of material, shade selection, Clinical technique for anterior composite restorations.	2
35.	**Composite Restorations** Composition, classification, properties Recent advances in composite resins Indications, contraindications, advantages, disadvantages	4

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	Step wise procedures of tooth preparation for composite restorations. Finishing and polishing of composite restoration	
36.	**Minimal Invasive Dentistry** Principles of MID, caries risk assessment, materials and techniques	2
37.	**Alternate methods of tooth preparation for restorations** Air abrasion, chemo mechanical method, lasers	1
	Topic for Final year (Part I) **Endodontics**	
38.	**Introduction, definition, scope and future of Endodontics**	1
39.	**Rationale and principles of Endodontics** Case selection, indication and contraindications for root canal treatments	2
40.	**Clinical diagnostic methods** Case history, diagnosis and treatment plan Clinical diagnostic methods Case history, diagnosis, pulp vitality assessment, recent advances and treatment plan	3
41.	**Microbiology of endodontic infection**	2
42.	**Isolation and infection control in Endodontics** Rubber dam application	1
43.	**Endodontic instruments** Hand instruments Power driven instruments Standardization Principles of using endodontic instruments Sterilization	3
44.	**Pulpal diseases** Classification, etiology, diagnosis, management	2
45.	**Periapical diseases:** Classification, etiology, diagnosis, management	2
46.	**Vital pulp therapy:** Indirect and direct pulp capping Pulpotomy - types and medicaments used Apexogenesis and apexification –multivisit and single visit apical barrier techniques, revascularization ,regenerative endodontics	3

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47.	**Esthetics in dentistry** Introduction and scope Facial proportions, Golden proportions Anatomy and physiology of smile Role of colour and translucency Esthetic recontouring Alteration of tooth form, shape, size and colour Management of discoloured teeth	4
48.	**Composite restorations** Recent advances in posterior composite resins Indications, contraindications, advantages and disadvantages Stepwise procedure of tooth preparation for composite restoration. Clinical technique for posterior direct composite restorations Finishing and polishing of composite restoration Indirect posterior composite restoration	4
49.	**Casts restorations** Indications, contraindications, advantage and disadvantages Materials used Class II cavity preparation for inlays Types of bevels in cast restoration Fabrication of wax patterns Differences in tooth preparation for amalgam and cast restorations	3
50.	**Casting** Die materials and preparation of dies Refractory materials Alloys used for casting Casting machines Casting procedure Casting defects Cementation of restoration	2
51.	**Temporisation or interim restoration** Materials and procedure	1
52.	**Root Caries** Etiology, clinical features and management	1

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53.	**Non carious destruction of tooth structure** Definition, etiology, diagnosis, clinical features and management	2
54.	**Ceramic Restorations** Recent advances in ceramic materials & techniques including CADCAM (in brief) Ceramic laminates, inlays, onlays and crowns, Indications, contraindications, advantages, disadvantages and techniques (in brief)	3
55.	**Direct Filling gold Restorations** Introduction Types of direct filling gold Indications, contraindications, advantages, disadvantages tooth preparation and restoration	1
	Final year (Part II)	
	Endodontics	
56.	**Emergency endodontic procedures**	2
57.	**Anatomy of pulp space** Root canal anatomy of maxillary and Mandibular teeth. Classification of canal configuration and variations in pulp space.	2
58.	**Access preparation** Objectives Principles Instruments used Sequential steps of access preparation for individual tooth	2
59.	**Preparation of root canal space** a. Determination of working length definition and methods of determining working length	1
	Cleaning and shaping of root canals Objectives Principles Instruments used Techniques – hand and rotary Step back & Crown down methods	2

60.	**Disinfection of root canal space** a. Irrigants Functions Requirements Types Methods and techniques of irrigation	1
	b. Intracanal medicaments Functions Requirements Types Method of placement and limitations	1
61.	**Problems during cleaning and shaping of root canal spaces** Perforation and its management Broken instruments and its management Management of curved root canals	2
62.	**Obturation of the root canal system** a. Materials- Ideal root canal filling material, classification of materials b. Obturation techniques Classification and procedure	2
63.	**Root canal sealers** Ideal properties Classification, functions Manipulation and application of root canal sealers	2
64.	**Post endodontic restoration** Principles of post endodontic restorations Post and core-materials and procedure(in brief)	2
65.	**Smear layer and its importance in endodontics and conservative treatment**	1
66.	**Discoloured teeth and its management** Classification, etiology Bleaching agents , Vital and non vital bleaching methods	1
67.	**Traumatized teeth** Diagnosis, Classification ,management of of luxated ,avulsed teeth ,root fracture,	2

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60.	**Disinfection of root canal space** a. Irrigants Functions Requirements Types Methods and techniques of irrigation	1
	b. Intracanal medicaments Functions Requirements Types Method of placement and limitations	1
61.	**Problems during cleaning and shaping of root canal spaces** Perforation and its management Broken instruments and its management Management of curved root canals	2
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66.	**Discoloured teeth and its management** Classification, etiology Bleaching agents , Vital and non vital bleaching methods	1
67.	**Traumatized teeth** Diagnosis, Classification ,management of of luxated ,avulsed teeth ,root fracture,	2

	vertical fracture	
68.	**Endodontic surgeries** Indication contraindications, pre operative preparation Surgical instruments and techniques Apicoectomy, retrograde filling Post operative sequale Trephination, hemisection Radisectomy Reimplantation (both intentional and accidental)	3
69.	Endo-perio lesions Portals of communication Etiology ,clinical features, diagnosis, classification and management	
70.	**Root resorption** Etiology and management	1
71.	**Success and failures of endodontic treatments**	1
72.	**Retreatment in Endodontics**	1
73.	**Specialized equipments-lasers, magnification loupes, dental operating microscopes(DOM) in conservative dentistry and endodontics**	1

c) ***Minimum requirement to appear for Final BDS Part II Conservative Dentistry and Endodontics University Examination:***

Sl.No	Clinical Procedure	No.
1	Case history recording, diagnosis and treatment planning	10
2	Management of deep caries lesions	5
3.	Glass ionomer restorations	20
4.	Composite restorations in anterior teeth	5
5.	Class I amalgam restorations	30
6.	Class II amalgam restorations	20
7.	Root canal treatment of anterior teeth	5

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d) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question from Conservative Topics One Question from Endodontic Topics	Structured Essays 2x 10marks	20
Two Questions from Conservative Topics including esthetics and Two Questions from Endodontic Topics	Short Notes 4 x 5marks	20
Questions from any of the Conservative & Endodontic topics.	Brief Notes 10x3marks	30
	Total	**70**

xiii. Theory

University Written	**70Marks**
Viva Voce	**20 Marks**
Internal Assessment	**10 Marks**

xiv. Clinical:

University Clinical Examination:	**80 Marks**
Internal Assessment:	**20 Marks**
	Grand Total 200 Marks

Details of Mark distribution for university Practical examination:

Clinical Exercise: 70 marks

Work Record : 10 marks

Clinical Exercises

1. Preparation for class II amalgam and restoration

   Or

2. Anterior composite restoration

   Or

3. Root canal treatment for anterior tooth up to selection of master cone

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Mark distribution for the clinical examinations

1. **Class II amalgam restoration**

i) Case history recording, examination, diagnosis and treatment planning	: 15 min	10 marks
ii) Tooth preparation	: 45 min	20 marks
iii) Base and matrix	: 15 min	15 marks
iv) Restoration and carving	: 30 min	25 marks
	Total	**: 70 marks**

2. **Anterior composite restoration**

i) Case history recording, examination, diagnosis and treatment planning	: 15 min	10 marks
ii) Tooth preparation	: 30 min	25 mark
iii) Lining and matrix	: 15 min	10 marks
iv) Restoration and finishing	: 45 min	25 marks
	Total	**: 70 marks**

3. **Anterior RCT**

i) Case history recording, examination, Diagnosis and treatment planning	: 15 min	10 marks
ii) Access preparation	: 30 min	25 marks
iii) Working length	: 15 min	10 marks
iv) Cleaning and shaping, Master cone selection	: 45 min	25 marks
	Total	**: 70 marks**

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21. PROSTHODONTICS AND CROWN & BRIDGE

a) THEORY:160 HOURS (IIyr. 25 hrs, IIIyr.65 hrs, Part I.40 hrs, Part II. 30 hrs)

Sl. No.	Topic	Description	Hours
	Removable Complete Prosthodontics		
1.	Applied Anatomy and Physiology	Introduction Biomechanics of the edentulous state. Residual ridge resorption	3
2.	Communicating with the patient	Understanding the patients, mental attitude. Instructing the patient.	1
3.	Diagnosis and treatment planning for patient.	With some teeth remaining. With no teeth remaining. Systemic status. Local factor. The geriatric patient Diagnostic procedures.	2
4.	Articulators – discussion		3
5.	Improving the patient's denture foundation and ridge relation- an overview	Pre-operative examination. Initial hard tissue & soft tissue procedure, Secondary hard & soft tissue procedure Implant procedure. Congenital deformities Postoperative procedure	3
6.	Principles of Retention, Support and Stability		2
7.	Impressions- detail.	Muscles of facial expression. Biologic considerations for maxillary and Mandibular impression including anatomy landmarks and their	7

		interpretation. Impression objectives Impression Materials Impression techniques. Maxillary and Mandibular impression procedures Preliminary impressions Final impressions. Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).	
8.	Record bases and occlusion rims- in details.	Materials & techniques Useful guidelines and ideal parameters.	2
9.	Recording and transferring bases and occlusal rims		1
10	Biological consideration in jaw relation& jaw movements – craniomandibular relations.	Mandibular movements. Maxillo- Mandibular relation including vertical and horizontal jaw relations.	3
11	Concepts of occlusion- discuss in brief.	Discuss in brief.	2
12.	Relating the patient to the articulator	Face bow types & uses – discuss in brief. Face bow transfer procedure- discus in brief.	1
13.	Recording Maxillo Mandibular relation.	Vertical relation Centric relation records. Eccentric relation records. Lateral relation records	4
14.	Tooth selection and arrangement.	Anterior teeth. Posterior teeth. Esthetic and functional	2

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		harmony.	
15.	Relating inclination of teeth to concept of occlusion- in brief.	Neutrocentric concept. Balanced occlusal concept.	2
16.	Trial dentures		3
17.	Laboratory procedures	Wax contouring. Investing of dentures. Preparing of mold. Preparing & packing acrylic resin. Processing of dentures. Recovery of dentures. Lab remount procedures Recovering the complete denture from the cast. Finishing and polishing the complete denture. Plaster cast for clinical denture remount procedure	3
18.	Denture insertion	Insertion procedures. Clinical errors. Correcting occlusal disharmony. Selective grinding procedures	3
19.	Treating problems with associated denture use	Discuss in brief (tabulation/ flow chart form).	1
20	Treating abused tissues	Discuss in brief	1
21	Relining and rebasing of dentures	Discuss in brief	2
22	Immediate complete dentures construction procedure	Discuss in brief	2
23	The single complete dentures	Discuss in brief	2
24	Overdentures	Discuss in brief	2
25	Implant Supported complete denture	Discuss in brief	3
26	Reduction of residual ridge	Discuss in brief	1

1.	Introduction		1
2	Terminologies and scope		1
3	Classification		2
4	Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.		2
5	Components of a removable partial denture.	Major connectors Minor connectors Rest and rest seats Direct retainers Indirect retainers Tooth replacement.	12
6.	Principles of Removable Partial Denture Design		3
7	Survey and design – in brief		1
8	Surveyors		1
9	Surveying		1
10	Designing		3
11	Mouth preparation and master cast		1
12	Impression materials and procedures for removable partial dentures		2
13	Preliminary jaw relation and esthetic try in for some anterior replacement teeth		2
14	Laboratory procedures for framework construction- in brief		1
15	Fitting the framework- in brief		1
16	Try in of the partial denture- in brief		1
17	Completion of the partial denture- in brief		1
18	Inserting the Removable partial denture in brief		1
19	Post insertion observations		1
20	Temporary Acrylic Partial Dentures		1
21	Immediate Removable Partial Denture		1
22	Removable partial Dentures opposing Complete denture.		1
	Fixed Partial Prosthodontics		
1.	Introduction		1

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2	Fundamentals of occlusion in brief.		1
3	Articulators	In brief.	1
4	Treatment planning for single tooth restoration.		1
5	Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.		2
6.	Fixed partial denture configurations		1
7	Principles of tooth preparations.		2
8	Preparations for full veneer crowns		3
9	Preparations for partial veneer crowns	In brief.	1
10	Provisional Restorations		1
11	Fluid Control and Soft Tissue Management		1
12	Impressions		1
13	Working Casts and Dies		1
14	Wax patterns		1
15	Pontics and Edentulous Ridges		1
16	Esthetic Considerations		1
17	Finishing and Cementation		1
18	Implant Supported Fixed Restorations		2
Miscellaneous Topics to Be Covered In Brief :			
1	Solder Joints and Other Connectors		35
2	All - Ceramic Restorations		
3	Metal - Ceramic Restorations		
4	Preparations of intracoronal restorations.		
5	Preparations for extensively damaged teeth.		
6	Preparations for Periodontally weakened teeth		
7	The Functionally Generated Path Technique		
8	Investing and Casting		
9	Resin - Bonded Fixed Partials Denture		
10	Digital impressions		
11	3D printing in Prosthodontics		
12	CAD-CAM in Prosthodontics		

It is

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suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover -

Definition

Diagnosis (of the particular situation /patient selection /treatment planning)

Types / Classification

Materials

Methodology - Lab /Clinical

Advantages & disadvantages

Indications, contraindications

Maintenance Phase

Recent advances

Failure

b) Mandatory requirement to appear for Final BDS part II Prosthodontics University Examination:

1. *Treating completely edentulous conditions with Complete Denture – Minimum 5 nos. (including all clinical and laboratory procedures)*
2. *Treating partially edentulous conditions with Removable Partial Denture – Minimum 5 nos. (including all clinical and laboratory steps)*
3. *Should have satisfactorily completed all the Preclinical Prosthodontic exercises*
4. *Minimum of one seminar presentation on any Prosthodontic topic. A hard copy of the seminar to be submitted at the time of University examination.*

c) *SCHEME OF EXAMINATION*

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question From Complete Denture topics and one from either FPD or RPD	Structured Essays 2x 10marks	20
Two Questions from Complete denture, One question from RPD, One question from FPD.	Short Notes 4 x 5marks	20
Questions from any of the Prosthodontic topics including implants, maxillofacial prosthesis & applied Dental materials	Brief Notes 10x3marks	30
	Total	**70**

xv. Theory

University Written	**70 Marks**
Viva Voce	**20 Marks**
Internal Assessment	**10 Marks**

xvi. Clinical:

University Clinical Examination:	**80 Marks**
Case History	*5 Marks*
Complete Denture clinical steps	*45 Marks*
Tooth Preparation on Typhodont	20 Marks
Clinical Work Record & Seminar	*10Marks*
Internal Assessment:	**20 Marks**
	Grand Total 200Marks

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22. PAEDIATRIC AND PREVENTIVE DENTISTRY

a) THEORY: 65 HOURS (III yr. 15 hrs. Final Yr. Part I. 20hrs Part II. *30 hrs.)*

Theory topics for III Year		
Sl. No.	**Topic**	**Hours**
	Introduction to Paediatric and Preventive Dentistry Definition, Scope, Objectives and Importance	**1**
1.	Dental Anatomy and Histology ♦ Chronology of Eruption of teeth ♦ Differences between primary and permanent teeth ♦ Eruption disorders and their management including teething, ectopic eruption, ankylosis etc. ♦ Importance of first permanent molar	**1**
2.	Growth and Development (will be covered by Department of Orthodontics also) ♦ Importance of study of growth and development in Pedodontics ♦ Prenatal and postnatal factors in growth and development ♦ Theories of growth and development ♦ Methods to measure growth ♦ Development of maxilla and mandible and age related changes	**2**
3.	Development of occlusion from birth to adolescence ♦ Mouth of neonate, gumpads ♦ Primary Dentition period ♦ Mixed dentition period ♦ Establishment of occlusion ♦ Study of variation and abnormalities	**2**
4.	Case history recording ♦ Principles of history taking, examination, investigations, ♦ diagnosis and treatment planning	**1**
5.	Child Psychology ♦ Definition ♦ Importance of understanding Child Psychology in Pedodontics ♦ Theories ♦ Psychological development from birth through adolescence	**4**

	♦ Dental fear, anxiety and their management, types of cry ♦ Application of Psychology principles in management of child ♦ patients in the dental office ♦ Psychological disorders including anorexia, bulimia ♦ Child abuse and neglect	
6.	Behaviour management ♦ Definition ♦ Classification and types of behaviour ♦ Factors influencing child behaviour ♦ Non- Pharmacologic management of behaviour ♦ Pharmacologic management of behaviour- ♦ Conscious sedation including nitrous oxide- oxygen inhalational anaesthesia ♦ Pharmacological principles in Paediatric Dentistry- drug dosage formulae ♦ Analgesics, anti-inflammatory and antibiotics commonly prescribed for children	4
	Theory topics for Final Year Part I	
7.	Dental Caries ♦ Diagnostic procedures and caries detection ♦ Caries pattern in primary, young permanent and permanent teeth ♦ Early childhood Caries, rampant caries- definition, classification, etiology, pathogenesis, clinical features, complications and management ♦ Role of diet and nutrition in dental caries and sugar substitutes ♦ Diet counselling and diet modifications ♦ Caries activity tests , caries prediction, susceptibility and their clinical application	3
8.	Dental Radiology as related to Pedodontics	1
1.	Dental materials used commonly in children and adolescents (Outline revision)	1
2.	Paediatric Operative Dentistry ♦ Principles of Operative Dentistry ♦ Isolation- Importance and techniques	5

	♦ Young Permanent Teeth and clinical considerations ♦ Modifications in cavity preparation and recent cavity designs for primary and young permanent teeth ♦ Atraumatic / Alternative Restorative Technique (ART) ♦ Other methods of caries removal ♦ Restoration of carious teeth (Primary, young permanent and permanent teeth) using various restorative materials like glass ionomers, composites, silver amalgam ♦ Preformed crowns: Stainless steel, polycarbonate and strip crowns	
3.	Gingival and Periodontal diseases in children ♦ Normal gingival and periodontium in children ♦ Definition, classification ♦ Etiology, Pathogenesis and management of gingival and periodontal condition seen in children and adolescents	2
4.	Flourides ♦ Historical background ♦ Systemic fluorides: Availability, agents, concentrations, advantages and disadvantages ♦ Topical fluorides: agents, composition, method of application both for professional and home use, advantages and disadvantages ♦ Mechanism of action and its anticariogenic effect ♦ Fluoride toxicity and its management ♦ Defluoridation techniques	4
5.	Paediatric Endodontics ♦ Principles and diagnosis ♦ Classification of pulp pathology ♦ Management of pulpaly involved primary, young permanent and permanent teeth including materials used and techniques followed: ♦ Pulp capping ♦ Pulpotomy ♦ Pulpectomy ♦ Apexogenesis ♦ Apexification	4
	Theory topics for Final Year Part II	

6.	Traumatic injuries to teeth ♦ Definition, classification ♦ Etiology and incidence ♦ Management of trauma to primary teeth ♦ Sequelae and reaction following trauma to primary teeth ♦ Management of trauma to young permanent teeth ♦ Prevention of trauma: mouth protectors	5
7.	Preventive Orthodontics ♦ Importance and functions of deciduous dentition ♦ Effects of premature loss of primary teeth Preventive Orthodontics: ♦ Definition ♦ Preventive measures ♦ Space loss ♦ Space maintenance and space management ♦ Space maintainers: definition, classification, indications and contra indications, advantages and disadvantages including construction of fixed space maintainers ♦ Space regainers ♦ Mixed dentition analysis ♦ Serial extraction	5
8.	Interceptive Orthodontics ♦ Oral Habits in children ♦ Definition, classification and etiology of all habits ♦ Clinical features of deleterious oral habits including non- nutritive sucking, mouth breathing, non functional grinding, masochistic and occupational habits ♦ Management of oral habits in children ♦ Other problems seen during primary and mixed dentition period and their management	4
9.	Dental management of children with special needs ♦ Definition, classification, etiology, clinical features, special considerations in the dental management of :	5

	♦ Physically handicapping conditions ♦ Mentally handicapping conditions ♦ Medically compromising conditions ♦ Genetic disorders and importance of genetic counseling including cleft lip and palate and its management	
10.	Oral surgical procedures in children ♦ Indications and contra indications for extraction ♦ Minor surgical procedures in children ♦ Knowledge of local and general anaesthesia	2
11.	Preventive Dentistry ♦ Definition, principles and scope ♦ Levels and types of prevention ♦ Infant oral health care and first dental visit Preventive measures: ♦ Minimal intervention ♦ Pit and fissure sealants ♦ Preventive resin restorations ♦ Newer agents available for caries prevention and demineralization ♦ Caries vaccine	4
12.	Nanodentistry – Introduction, principles and technique – an outline	1
13.	Dental Health Education and school dental health programmes	1
14.	Importance of Dental HOME and anticipatory guidance	1
15.	Dental emergencies in children and their management	1
16.	Setting up of paediatric dental practice including ethics	1

b) *PRACTICALS/ CLINICALS*

Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of orofacial region. Training is also imparted in management whenever possible.

In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination.

The following is the minimum prescribed clinical and academic requirement.

1. Case taking : 25 cases

Long case-

*

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Detailed history taking & clinical examination, formulating diagnosis and planning comprehensive treatment for the child -**3 nos.**

A very detailed history taking including diet chart recording, space analysis etc - **2nos.**

Short case-

History taking (briefly), clinical examination, formulating diagnosis and treatment planning- **20 nos.**

1. Preventive measures

   Oral prophylaxis after using disclosing agents - **25nos.**

   Topical fluoride application - **25 nos.**

   Pit and fissure sealant application – **2nos**

2. Permanent Restorations:- **45 nos.**
3. Removable orthodontic appliances

   Space maintainers / Habit breakers / Hawley's appliance - **10nos.**

4. Dental Extractions under LA

   Extraction of deciduous and permanent teeth –**30nos.**

5. Special Dentistry

   Treatment for children with special health care needs - **1 no.**

6. Assignments on the topics given below in the year wise split-up
7. Seminar

   Presentation of seminars, preferably in power point, during the Final year Part II clinical posting in the department. Seminar certified by the HOD should be submitted in a book form along with the record at the time of University Practical Examination.-**1 no.**

Clinical requirement –Year wise split up

Sl. No	Topic	Procedures in III year	Minimum requirement
1.	Case taking	Long case- Detailed history taking & clinical examination, formulating diagnosis and planning comprehensive treatment for the child.	2
2.	Preventive measures	1. Oral prophylaxis after using disclosing	5

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		agents 2. Topical fluoride application	5
3.	Permanent Restorations	Amalgam or glass ionomer cement	5
4.	Removable orthodontic appliance	Space maintainer /Habit breaker/Hawley's appliance	1
5.	Dental Extractions	Extraction of mobile deciduous teeth	5
6.	Assignments	Assignments on Milestones of development, Immunisation schedule, Chronology of human dentition & Stages of tooth development, Tooth numbering systems, Eruption sequence, Early and Delayed eruption, Sterilization in dental office, Amalgam-types, composition and setting reaction, GIC- types, composition and setting reaction, Post operative instructions for various clinical procedures- after extractions, restorative work and orthodontic appliance insertion (It should be written in the clinical record and submitted before the end of III year posting in the department)	
7.	A study model/chart/ poster		1
Procedures in Final year (Part I)			
1.	Case taking	Long case- All patient records- clinical & investigative records- like study models, pre-treatment and post- treatment photographs, prints of the radiographs etc Short case- History taking(briefly), clinical examination, formulating diagnosis and treatment planning	1 10
2.	Preventive measures	Oral prophylaxis	15

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		Topical fluoride application	15
3.	Permanent Restorations	Amalgam/GIC	20
4.	Dental Extractions	Extraction of anterior or posterior deciduous teeth under LA	15
5.	Removable orthodontic appliance	Space maintainers/ habit breakers/Hawley's appliance	5
6.	Assignments	Assignments on Dental age and Assessment methods, Topical fluorides, Pulp vitality tests	
Procedures in Final Year (Part II)			
1	Case taking	A very detailed history taking including diet chart recording, space analysis etc Short case -	2 10
2	Preventive measures	Oral prophylaxis Topical fluoride application	5 5
3	Permanent Restorations	Amalgam/GIC	20
4	Removable orthodontic appliances	Space maintainer/Habit breakers/Hawley's appliance	4
5	Dental Extractions	Extraction of teeth including permanent posterior teeth, root stumps, grossly decayed deciduous teeth- under LA	10
6	Treatment for children with special health care needs	Treatment for children with cardiac problem/bleeding disorders/neurological problems/ mentally challenged/visual/ hearing impairment etc	1
7	Seminar	Seminar on allotted topic should be presented with power point and the print and soft copies should be submitted to the Head of the department before the end of Part II posting.	1

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c) *SCHEME OF EXAMINATION*

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Paediatric & Preventive Dentistry Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	**70**

xvii. Theory

University Written	**70 Marks**
Viva Voce	**20 Marks**
Internal Assessment	**10 Marks**

xviii. Clinical:

University Clinical Examination:	**80 Marks**
Case History, Clinical Examination, Diagnosis & Treatment Planning	40 *Marks*
Clinical Procedure: Oral prophylaxis and topical fluoride application/ Restoration of decayed tooth/ Extraction of tooth	20 Marks
Chair side preparation & Measures taken for infection control	5 Marks
Overall management of the child patient & Post operative instructions	*5 Marks*
Clinical Work Record + Seminar + Chart/Poster/Study model	5+3+2=10 *Marks*
Internal Assessment:	**20 Marks**
	Grand Total 200Marks

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2.7 *Total number of Hours (split up)*

Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
General Human Anatomy including Embryology and Histology	100	175		275
General Human Physiology	120	60		180
Biochemistry, Nutrition and Dietetics	70	60		130
Dental Anatomy, Embryology and Oral histology	105	250		355
Dental Materials	80	240		320
General and Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
General Microbiology	65	50		115
General Medicine	60		90	150
General Surgery	60		90	150
Oral Pathology &Oral Microbiology	145	130		275
Oral Medicine & Radiology	75		200	275
Paediatric & Preventive Dentistry	65		320	385
Orthodontics & Dentofacial Orthopaedics	70	160	200	430
Periodontology	80		200	280
Oral & Maxillofacial Surgery	76		370	446
Conservative Dentistry & Endodontics	160	200	370	730
Prosthodontics and Crown & Bridge	160	340	370	870
Public Health Dentistry	74		200	274
Total	**1660**	**1740**	**2410**	**5840**

Note:

There should be a minimum of 240 teaching days every academic year consisting of at least 6 working hours a day excluding one hour of lunch break each day.

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Prosthodontics and Crown and Bridge

Course Code: 241

(2016-17 Academic year onwards)

forward by theca.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

Course Contents

Syllabus for MDS PROSTHODONTICS AND CROWN & BRIDGE

A strict division of the subject may not be possible and some overlapping of subjects is inevitable. Students should be prepared to answer overlapping subjects.

The concept of health care counseling shall be in corporated in all relevant areas

The MDS theory examination consist of four papers

Paper I - Applied Anatomy, Physiology, Pathology and Dental Materials

Paper-II- Removable Prosthodontics and Oral Implantology
Paper-III- Fixed Prosthodontics

Paper-IV -Essay

PAPER I - Applied Anatomy, Physiology, Pathology and Dental Materials

1. Applied General Anatomy of the Head and Neck, Oral and Dental Anatomy and Histology.

1.1. Embryology

1.1.1. Early embryology, development up to the appearance of the three primary germ layers.
1.1.2. Histogenesis and organogenesis.
1.1.3. Post natal growth and development of bony and soft tissue structure of the head and neck.
1.1.4. Development of Branchial arches, Pharyngeal pouches & cleft

1.2. Applied General Anatomy

1.2.1. Osteology of facial bones.
1.2.2. Face – Facial Muscles, Nerve supply, Blood supply, Lymphatic drainage.
1.2.3. Myology – Muscles of Facial Expression, Mastication
1.2.4. Cranial Nerves (5,7)
1.2.5. Salivary glands.

1.2.6. Palate
1.2.7. Anatomy of Tongue – muscles, blood and nerve supply.
1.2.8. TM Joint – Movements, relations, anomalies and age changes.

1.3. Oral and Dental Anatomy

1.3.1. Morphology of individual teeth in primary and permanent dentition with variations.
1.3.2. Occlusion, dental arch formation, development of occlusion from gum pads, deciduous, mixed and permanent dentition.
1.3.3. Sequence of eruption.
1.3.4. Tooth Numbering Systems

1.1. General Histology

1.4.1. Different types of epithelium
1.4.2. Bone

1.5. Oral Histology

1.5.1. Histology of developing tooth germ, enamel, dentin, cementum, periodontal ligament, pulp, alveolar bone, oral mucous membrane, salivary glands, gingival, gingival sulcus and epithelial attachment.
1.5.2. ENAMEL: Physical characteristics, chemical properties, structure clinical considerations. age changes.
1.5.3. DENTIN: Physical characteristics, chemical properties, structure. Types of dentin. Dentin innervation and hypersensitivity.
1.5.4. CEMENIUM: Physical characteristics, chemical properties, structure. Clinical consideration. Age changes.
1.5.5. PERIODONTAL LIGAMENT: Cells and fibers. Functions. Clinical Considerations. Age Changes.
1.5.6. ALVEOLAR BONE: Physical characteristics, chemical properties and structure

2. Applied General and Oral Physiology

2.1 General principles of Human Physiology.
2.2 Blood - Composition & functions
2.3 Anemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigment
2.4. Haemostasis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
2.5. Hemorrhage
2.6. Blood Pressure – Definition, normal values, variations, determinants. Control and Maintenance.
2.7 Hemorrhage and Shock.

3. Applied Pharmacology and therapeutics

3.1 Mechanism of drug action.
3.2 Mechanism of Detoxication in the Body.
3.3 Intolerance, Tolerance, Cumulative action, Synergism, Antagonism.
3.4 Dosage, Classification of Drugs.
3.5 Local Anesthetics.

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3.6 Analgesics
3.7 Antiseptics and Disinfectants.

4. Applied General and Oral Pathology and Microbiology.

4.1 Cellular adaptation, Cellular degeneration, Apoptosis, Oncosis, Necrosis, Gangrene, Pathologic calcification
4.2 Intracellular accumulations – Fatty changes, deposition of proteins, glycogen
4.3 Detailed study of Inflammation - Definition, Vascular phenomena, Inflammatory Exudates, Localization of infection, Tissue changes in inflammation and variations of Inflammation.
4.4 Healing, Regeneration, Repair Mechanisms, Healing by primary intention, Healing by secondary intention, Fracture healing, Factors influencing healing process, Complications. Healing of a wound – organization, parenchymal repair, healing of a socket after extraction
4.5 Hemorrhage and Shock.
4.6 Atrophy, Hypertrophy, Hyperplasia, Metaplasia, Dysplasia
4.7 Anaemia - classification, Iron Deficiency anaemia, Megaloblastic anaemia, Hemolytic anaemias
4.8 Coagulation cascade
4.9 Dental caries – Etiology, histopathology, clinical characteristics and sequelae.
4.10 Pulpitis – Etiology, Pathology and sequelae of Acute and Chronic Pulpitis.
4.11 Acute apical periodontitis and dentoalveolar abscess.
4.12 Topography of root ends and surrounding structures, relationship between maxillary teeth and maxillary sinus.

5.Microbiology

5.1 Infection Control
5.2 Sterilization with special reference to dental office. Sterilization and Asepsis.
5.3 Hand washing and hand hygiene.
5.4 Personal protective equipments.
5.5 Handling of sharp instruments.
5.6 Needle-stick injury, exposure to body fluids. .
5.7 Post-exposure prophylaxis.
5.8 Management and disposal of waste.

6. RESEARCH METHODOLOGY, BIOSTATISTICS

6.1 Research Methodology

6.1.1 What is research ?
6.1.2 What is research methodology
6.1.3 Study Designs
6.1.3.1 Epidemiological studies, Observations, Descriptive, Cohort case control studies.
6.1.3.2 Experimental, Clinical trials (Randomized control), Community trends (Non randomized)

6.2 Biostatistics

6.2.1 Introduction to Biostatistics – Application of statistics on Dental Health.
6.2,2 Descriptive statistics – Definition, Presentation of Statistics, Measures of Central tendency – measures of Dispersion, Normal distribution, Binomial Distribution

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6.2.3 Collection, compilation, and graphical representation of statistical data, techniques of sampling, bias in sampling.

6.2.4 Inferential statistics – Testing of Hypothesis, standard error, t-test, Z-test, chi square test, Analysis of Variance, "U" test.

6.2.5 Correlation and Regression.

7. Dental Radiology

7.1. Introduction
7.2. Sources
7.3. Principles of x-ray production
7.4. Radiographic Principles and Techniques
7.5. Recent advances in imaging, viz., Digital imaging,CBCT etc

8. Medical Emergencies & Management

8.1. Prevention – Introduction, Prevention, Preparation, Medico legal considerations
8.2. Unconsciousness - general considerations, Vasodepressor syncope, Postural hypotension,
8.3. Diabetes mellitus – hyperglycemia and hypoglycemia

9. Ethics in Dentistry

9.1 Introduction to ethics:
- 9.1.1 What is ethics?
- 9.1.2 What are values and norms?
- 9.1.3 How to form a value system in one's personal and professional life?
- 9.1.4 Hippocratic oath.

9.2 Ethics of the Individual
- 9.2.1 The patient as a person
- 9.2.2 Right to be respected
- 9.2.3 Truth and confidentiality
- 9.2.4 Autonomy of decision
- 9.2.5 Doctor patient relationship

9.3 Professional Ethics
- 9.3.1 Code of conduct
- 9.3.2 Contract and confidentiality

10.APPLIED DENTAL MATERIAL SCIENCES

10.1Introduction

10.2. Structure of matter.

10.3. Physical properties of dental materials

10.4. Mechanical properties of dental materials

10.5. Biocompatibility of dental materials.

10.6. Hydrocolloid Impression materials

10.7. Non aqueous elastomeric impression materials.

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10.8. Inelastic impression material

10.9. Gypsum products

10.10. Synthetic resins

10.11. Denture base resins

10.12. Restorative resin

10.13. Bonding

10.14. Solidification and micro structure of metals

10.15. Constitution of alloys

10.16. Corrosion

10.17. Dental casting alloys & metals

10.18. Inlay casting wax

10.19. Investments

10.20. Casting procedure

10.21. Dental cements

10.22. Ceramics

10.23. Soldering

10.24. Wrought base metal & gold alloys

10.25. Dental implant materials

10.26. Maxillofacial prosthetic materials

10.27. Lasers in dentistry

10.28. Finishing & polishing materials

10.29. Mechanics of cutting with dental burs

10.30. Recent developments in dental materials

10.31. Materials used for the treatment of craniofacial disorders –

Clinical, treatment and Laboratory materials, Associated materials, Technical consideration, shelf life, storage, manipulation, sterilization and waste management.

PAPER II - Removable Prosthodontics and Oral Implant ology.

1.1. REMOVABLE COMPLETE PROSTHODONTICS

1.1.1. Introduction

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1.1.2. Applied anatomy and physiology of oral and maxillofacial region including age changes

1.1.3. Diagnosis and Treatment planning

1.1.4. Residual ridge resorption

1.1.5. Mouth preparation

1.1.6. Impression procedures including the various theories of impression making.

1.1.7. Maxillo-mandibular relations.

1.1.8. Mandibular movements.

1.1.9. Articulators and Face Bows.

1.1.10. Selection and arrangement of teeth.

1.1.11. Occlusion

1.1.12. Verification of the jaw relations

1.1.13. Processing and finishing of Complete Dentures

1.1.14. Laboratory remount

1.1.15. Denture insertion

1.1.16. Clinical remount and recall checkup

1.1.17. Troubleshooting

1.1.18. Repair, relining and rebasing.

1.1.19. Duplication of denture

1.1.20. Immediate denture

1.1.21. Single complete denture

1.1.22. Overdenture

1.1.23. Principles of Aesthetics including characterization of denture.

1.1.24. Infection control and biomedical waste management in Prosthodontics.

Annoor Dental College & Hospital

1.2. Removable Partial Denture

1.2.1. Introduction
1.2.2. Classification of partially edentulous situation
1.2.3. Examination, diagnosis, treatment planning
1.2.4. Components of removable partial denture
1.2.5. Principles of RPD, forces acting on RPD, control of stresses
1.2.6. Surveyor
1.2.7. Surveying Principles, procedure and designing
1.2.8. Mouth preparation
1.2.9. Impressions for distal extension RPD
1.2.10. Jaw Relations
1.2.11. Laboratory procedure
1.2.12. Insertion and post insertion follow up
1.2.13. Failures in RPD.
1.2.14. Repair lining.
1.2.15. Immediate RPD.
1.2.16. Transitional Denture.
1.2.17. Interim denture.
1.2.18. Dental Material aspects related to RPD.

1.3 Oral Implantology

1.3.1 Implant Supported Partial Dentures
1.3.2 Introduction and Terminology
1.3.3 Diagnosis and treatment Planning
1.3.4 Classification of Prostheses
1.3.5 Biomechanics in Oral Implantology
1.3.6 Cement retained and Screw retained prostheses.
1.3.7 Principles of Occlusion in Implantology.
1.3.8 Progressive Bone loading
1.3.9 Immediate Load applications in Implant dentistry
1.3.10 Implantology related to implant supported Overdentures.
1.3.11 Implantology related to maxillofacial prosthetics.
1.3.12 Failures in implant supported fixed partial dentures
1.3.13 Recent advances in implantology
1.3.14 Maintenance and Hygiene.

1.4 Maxillofacial Rehabilitation

1.4.1 Scope, terminology and definitions.
1.4.2 Behavioral and psychological issues in Head and neck cancer,
Psychodynamic interactions - clinician and patient
Cancer Chemotherapy: Oral Manifestations, Complications, and management,
Radiation therapy of head and neck tumors: Oral effects, Dental manifestations and dental treatment:
Etiology, treatment and rehabilitation (restoration)- Acquired defect of the mandible, acquired defects of hard palate, soft palate
Clinical management of edentulous and partially edentulous maxillectomy patients, Facial defects,
Restoration of speech, Velopharyngeal function, cleft lip and palate, cranial implants maxillofacial trauma, Lip and cheek support prosthesis,
Laryngectomy aids, Obstructive sleep apnoea, Tongue prosthesis, Esophageal prosthesis, Vaginal radiation carrier, Burn stents, Nasal stents, Auditory inserts,
Trismus appliances, mouth controlled devices for assisting the handicapped
Custom prosthesis for lagophthalomos of the eye. Osseointegrated supported facial and maxillofacial prosthesis. Resin bonding for maxillofacial prosthesis,
Implant rehabilitation of the mandible compromised by radiotherapy,
Craniofacial Osseointegration, Prosthodontic treatment,
Material and laboratory procedures for maxillofacial prosthesis.

1.5 Maxillofacial Prosthetics

1.5.1 Obturators
1.5.2 Occlusal splints
1.5.3 Gunning Splint
1.5.4 Guiding Flange appliance
1.5.5 Other prostheses like ocular prosthesis, finger prosthesis, ear prosthesis, etc.
1.5.6 Dental Material aspects related to Maxillofacial prosthetics.

2. PAPER III - FIXED PARTIAL PROSTHODONTICS, OCCLUSION, TMJ AND AESTHETICS

2.1. Tooth Supported Fixed Partial Dentures

2.1.1. Introduction
2.1.2. Diagnosis and treatment planning
2.1.3. Occlusion in detail
2.1.4. Mandibular movements, occlusal correction
2.1.5. Articulators and face –bow
2.1.6. Classification of FPD and parts of FPD
2.1.7. Retainers – Classification, Indications
2.1.8. Selection of Retainers
2.1.9. Principles of tooth preparations
2.1.10. Preparation of vital and endodontically treated teeth to receive various retainers
2.1.11. Fluid control and soft tissue management.
2.1.12. Preparation of special tray and impression making
2.1.13. Preparation various dies

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2.1.14. Maxillomandibular relations and relating them to articulators.
2.1.15. Laboratory procedures including preparation of wax pattern, casting and finishing.
2.1.16. Failures in FPD.
2.1.17. Dental Material aspects related to FPD.

2.2. OCCLUSION

2.2.1. Evaluation, Diagnosis and Treatment of Occlusal Problems

2.2.2. Scope, definition, terminology, optimum oral health, anatomic harmony, functional harmony, occlusal stability, causes of deterioration of dental and oral health, Anatomical, physiological, neuro-muscular, psychological, considerations of teeth, muscles of mastication, temporomandibular joint, intra oral and extra oral and facial musculatures, the functions of Craniomandibular system.

2.2.3. Occlusal therapy, the stomatognathic system, centric relation, vertical dimension, the neutral zone, the occlusal plane, differential diagnosis of temporomandibular disorders, understanding and diagnosing intra articular problems, relating treatment to diagnosis of internal derangements of TMJ, Occlusal splints, Selecting instruments for occlusal diagnosis and treatment, mounting casts, Pankey-mann-schuyler philosophy of complete occlusal rehabilitation, long centric, anterior guidance, restoring lower anterior teeth, restoring upper anterior teeth,determining the type of posterior occlusal contours, methods for determining the plane of occlusion, restoring lower posterior teeth, restoring upper posterior teeth, functionally generated path techniques for recording border movements intra orally, occlusal equilibration, Bruxism, Procedural steps in restoring occlusions, requirements for occlusal stability, solving occlusal problems through programmed treatment planning, splinting, solving - occlusal wear problems, deep overbite problems, anterior overjet problems, anterior open bite problems. Treating - end to end occlusion, splayed anterior teeth, cross bite patient, Crowded, irregular, or interlocking anterior bite, using Cephalometrics for occlusal analysis, solving severe arch malrelationship problems, transcranial radiography, postoperative care of occlusal therapy.

2.3. TMJ

2.3.1. Temporomandibular joint and its function, Temporomandibular joint dysfunction - Scope, definitions, and terminology Orofacial pain, and pain from the temporomandibular joint region temporomandibular joint dysfunction, temporomandibular joint sounds, temporomandibular joint disorders

2.3.2. Anatomy related, trauma, disc displacement, Osteoarthrosis/Osteoarthritis, Hyper mobility and dislocation, infectious arthritis, inflammatory diseases, Eagle's syndrome (Styloid - stylohyoid syndrome), Synovial chondromatosis, Osteochondrrosis disease, Ostonecrosis, Nerve entrapment process, Growth changes, Tumors, Radiographic imaging

2.3.3. Etiology, diagnosis and cranio mandibular pain, differential diagnosis and management, orofacial pain - pain from teeth, pulp, dentin, muscle pain, TMJ pain -psychologic, physiologic – endogenous control, acupuncture analgesia, Placebo effects on analgesia, Trigeminal neuralgia, Temporal arteritis

2.3.4. Occlusal splint therapy - construction and fitting of occlusal splints, management of occlusal splints, therapeutic effects of occlusal splints, occlusal splints and general muscles performance, TMJ joint uploading and anterior repositioning appliances, use and care of occlusal splints.

2.3.5. Occlusal adjustment procedures - Reversible - occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy - occlusal repositioning appliances, orthodontic treatment, Orthognathic surgery, fixed and emovable prosthodontic treatment and occlusal adjustment, removable

prosthodontic treatment and occlusal adjustment, Indication for occlusal adjustment, special nature of orofacial pain, Indication for occlusal adjustment, special nature of orofacial pain, Psychopathological considerations, occlusal adjustment philosophies, mandibular position, excursive guidance, occlusal contact scheme, goals of occlusal adjustment, significance of a slide in centric, Preclinical procedures, clinical procedures for occlusal adjustment.

2.4. AESTHETICS

2.4.1. Scope, definitions, Morpho psychology and esthetics, structural esthetic rules - facial components, dental components, gingival components physical components.

2.4.2. Esthetics and its relationship to function - Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects.

2.4.3. Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises

2.4.4.Smile - classification and smile components, smile design, esthetic restoration of smile.

2.4.5. Esthetic management of the dentogingival unit, intraoral plastic surgery for management of gingival contours, and ridge contours, Periodontal esthetics,

2.4.6. Restorations - Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit anatomy, inclinations, form, size, shape, color, embrasures, contact point.

3. PAPER – IV – ESSAY

A 3 hour essay on any of the major topics in Prosthodontics.

PROSTHODONTIC TREATMENT MODALITIES

1. Tooth and tooth surface restorations
   Veneers - composites and ceramics
   Inlays- composite, ceramic and alloys
   Onlay - composite, ceramic and alloys
   Partial crowns - ¾th, 7/8th, proximal ½ crowns
   Pin-ledge restorations.
   Radicular crowns
   Full crowns
2. Tooth Replacements - PARTIAL /COMPLETE
   Tooth supported Fixed partial denture, Overdenture
   Tissue Supported Interim partial denture, Complete denture,
   Immediate denture
   Tooth and tissue supported Cast partial denture, Overdenture
   Precision attachment
   Implant supported Cement retained, Bar & clip attachment
   Screw retained Ball attachment
   Tooth and implant supported, Screw retained
   Cement retained
   Root supported, Dowel and core, Overdenture, Pin retained

3. Tooth and tissue defects (Maxillo- facial and Cranio-facial prostheses)
   Cleft lip and palate
   Partial and complete anodontia related to various syndromes
   Splints and stents as adjuncts to surgical procedures
   Prostheses for facial defects
   Auricular, nasal, ocular, orbital prostheses

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Craniofacial implants
Prostheses following hemi mandibulectomy and maxillectomy
Speech and velopharyngeal prostheses ▫ Laryngectomy aids, prosthetic nasal stents, burn stents, auditory inserts. Trismus appliance- screw gag

4. T.M.J and Occlusal disturbances
   Occlusal equilibration
   Splints - Diagnostic Repositioners / Deprogrammers
   Anterior bite plane
   Posterior bite plane
   Bite raising appliances
   Occlusal rehabilitation
5. Esthetic/Smile designing
   Laminates / Veneers
   Tooth contouring (peg laterals, malformed teeth)
   Tooth replacements
   Inter disciplinary management
6. Geriatric Prosthodontics
   Prosthodontics for the elderly
   Behavioral and psychological counseling
   Removable Prosthodontics
   Fixed Prosthodontics
   Implant supported Prosthodontics
   Maxillofacial Prosthodontics
   Psychological and physiological considerations
7. Preventive measures
   Modulation of diet and nutrition; counseling

PRECLINICAL EXCERCISES

- **Complete Denture**

1. Special tray with spacer in auto polymerizing resin
   i. Maxillary
   ii. Mandibular
2. Occlusal rims on maxillary and mandibular permanent bases
3. Teeth arrangement
   i. Class I
   ii. Class II
   iii. Class III with posterior cross bite
   iv. Balanced arrangement of teeth (Class I)
4. Acrylized balanced complete denture (Class I)

- **Removable Partial Denture**

1. Surveying, designing and wax pattern on mandibular and maxillary casts
   i. Kennedy Class I

ii. Kennedy Class II

iii. Kennedy Class III

iv. Kennedy Class IV

2. Complete laboratory steps in the fabrication of anyone class of partial denture

- **Fixed Partial Denture**

Preparation of natural teeth mounted on a phantom head

1. Full crown
   i. Anterior
   ii. Posterior
2. Partial Veneer Crown
   i. ¾th crown on Canine
   ii. ¾th crown on Premolar
   iii. Proximal half-crown on mandibular second molar
   iv. 7/8th crown maxillary first molar
3. Preparation for
   porcelain laminate
   veneer Maxillary
   central incisor

- **Implant dentures**

1. Preparation of impression tray
   i. Open impression
   ii. Closed impression
2. Surgical guide for implant placement
3. Fabrication of radiographic template

STRUCTURED TRAINING PROGRAMME MDS FIRST YEAR

1. Preclinical works and lab exercises to be completed within 6 months
2. Seminars – 5 Nos (Applied basic sciences)
3. Library Dissertation to be completed in first year
4. Dissertation topic & submission of protocol of proposed dissertation work after obtaining ethical clearance –within 9 months
5. Journal review-6 no's
6. Attending conferences and Continuing Educational programmes Minimum 2 CDEs, 2 Conferences (one National)
7. Complete Dentures cases-20, Temporary RPD cases-20, maxillofacial prostheses-5

8. Publication of scientific articles –minimum one
9. Clinical training
   9.1. Maintenance of a log book of recorded cases
10. Lecture classes for undergraduates – A minimum of 5 Lecturer classes should be taken for Undergraduate in presence of teaching faculty
11. Basic computer application- MS Office, Photo editing
12. Completion of seminar Vol.1

MDS SECOND YEAR

1. Journal review – 6Nos.
2. Seminar - 5 Nos (CD and RPD)
3. Clinical works
   3.1. Conventional CD-30
   3.2. Balanced CD -7
   3.3. Temporary RPD-30
   3.4. Crown /FPD-25
   3.5. MFP-15
   3.6. Cast RPD-5
   3.7. Case discussion – 10nos
4. Presenting Scientific papers/posters during state and national conferences -2 (one national)
5. Attending CDE-3
6. Publication of scientific articles-1
7. Lecturers for undergraduate students –A minimum of 5 Lecturer classes should be taken for Undergraduates in presence of teaching faculty.
8. Maintenance of Log book of recorded cases

MDS THIRD YEAR

1. Clinical Requirements in the 3rd year
   1.1. Conventional CD-10
   1.2. Temporary RPD-10
   1.3. Balanced CD- 5
   1.4. FPD cases-20
   1.5. MFP cases-10
   1.6. Cast RPD-5
   1.7. Implants-10 cases, out of which 2 implant supported overdentures
   1.8. Full mouth occlusal rehabilitation-2

2. Journal review-5
3. Publication of Scientific articles – 3nos
4. CDE – 3nos
5. Seminars – 5 Nos (FPD and Oral Implantology)
6. Presentation of scientific papers in National and State level conferences –1+2
7. Case discussions – 10nos
8. Submission of Photo album on clinical cases- A minimum of 20 different types of cases
9. Submission of seminars vol. 1, 2 &3
10. Lecture classes for Undergraduates - A minimum of 5 Lecturer classes should be taken for Undergraduates in presence of teaching faculty.
11. At the end of 30th month of commencement of course, dissertation should be submitted

MDS CLINICAL TRAINING

Developing essential skills

*** Key**

O -Observes a procedure performed by a faculty A-Assists a senior faculty

PA- performs procedure under the direct supervision of a senior specialist

PI-Performs independently

PROCEDURE	CATEGORY			
	O	A	PA	PI
Tooth surface restorations				
Composites - fillings, laminates, inlay,	2	2	2	8
onlay Ceramics - laminates, inlays, onlays	1	1	1	8

CROWNS

FVC in metal	1	2	2	10
FVC in all ceramic	1	2	2	10
FVC in full Metal	1	2	2	2
ceramic All ceramic-	1	1	1	2
3/4th crowns molar	1	-	-	5
7/8th crown on maxillary molar	1	-	-	5
Proximal half crown	1	-	-	5

Dr. Giju George Baby
Principal
Annoor Dental College & Hospital
Muvattupuzha - 686673

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)
Periodontology

Course Code: 242

(2016-17 Academic year onwards)

2016

2. COURSE CONTENT

2.1 Title ofcourse:

MDS Periodontology

2.2 Objectives ofcourse

1. **Goals**

   The goals of postgraduate training in various specialities are to train the BDS graduate who will:

   - Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
   - Exercise empathy and a caring attitude and maintain high ethical standards.
   - Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
   - Willing to share the knowledge and skills with any learner, junior or a colleague.
   - To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. **Objectives**

   The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

   The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

   1. Knowledge (CognitiveDomain)
   2. Skills (PsychomotorDomain)
   3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.

- Undertake audit; use information technology and carry out research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communicationabilities

- Adopt ethical principles in all aspects ofpractice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Periodontics is the science dealing with the health and diseases of the investing and supporting structures of the teeth and oral mucous membrane.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.

ii. No student shall be permitted to complete the course by attending more than 6 continuous years.

iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6. Syllabus

The syllabus for the theory of Periodontology should cover the entire field of the subject and the following topics may be used as guidelines only and not limited to them.

The concept of health care counseling shall be in corporated in all relevant areas.

The theory examination in MDS Periodontology consists of four papers as given below.

Paper-I - Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology and Biostatistics
Paper-II-Etiopathogenesis
Paper-III-Clinical Periodontology and Oral Implantology
Paper-IV -Essay

Syllabus distribution among the four papers

Paper I: Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology and Biostatistics

1. Applied Anatomy:

1.1.Development of thePeriodontium
1.2.Micro and Macro structural anatomy and biology of the periodontal tissues
1.3.Age changes in the periodontal tissues
1.4.Anatomy of the Periodontium
1.4.1.Macroscopic and microscopic anatomy
1.4.2.Blood supply of the Periodontium
1.4.3.Lymphatic system of the Periodontium
1.4.4.Nerves of thePeriodontium
1.5.Temporomandibular joint, Maxillae and Mandible
1.6.Cranial nerves 5,7,9,11,12.
1.7.Tongue,oropharynx
1.8.Muscles of mastication

2.Physiology

1. Blood
2.Respiratory system

3. Cardiovascularsystem

3.1.Blood pressure

3.2.Normal ECG

3.3.Shock

4. Endocrinology - hormonal influences on Periodontium

5. Gastrointestinal system

5.1.Salivary secretion-composition,function & regulation

5.2.Reproductive physiology

5.2.1.Hormones- Actions and regulations, role in periodontal disease

5.2.2.Family planning methods

6. Nervous system

6.1.Pain pathways

6.2.Taste -Taste buds, primary taste sensation & pathways for sensation

3. Biochemistry

3.1.Basics ofcarbohydrates, lipids, proteins, vitamins, proteins, enzymes and minerals

3.2.Diet and nutrition and periodontium

3.3.Biochemical tests and their significance

3.4.Calcium and phosphorus

4. Pathology

4.1.Cell structure and metabolism

4.2.Inflammation and repair,necrosis and degeneration

4.3.Immunity and hypersensitivity

4.4.Circulatory disturbances - edema, hemorrhage, shock, thrombosis, embolism, infarction and hypertension

4.5.Disturbances of nutrition

4.6.Diabetes mellitus

4.7.Cellular growth and differentiation, regulation

4.8.Lab investigations

4.9. Blood

5. Microbiology:

5.1. General bacteriology

5.1.1 Identification of bacteria

5.1.2.Culture media and methods

5.1.3.Sterilization and disinfection

5.2. Immunology and Infection

5.3. Systemic bacteriology with special emphasis on oral microbiology - Staphylococci, genus Actinomyces and other filamentous bacteria and Aggregatibacter actinomycetumcomitans

5.4.Virology

5.4.1.General properties of viruses

5.4.2.Candidasis

5.5.Applied microbiology

5.6.Diagnostic microbiology and immunology, hospital infections and management

6. Pharmacology:

6.1.General pharmacology

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6.1.1.Definitions - pharmcokinetics with clinical applications, routes of administration including local drug delivery in periodontics

6.1.2.Adverse drug reactions and drug interactions

6.2.Detailed pharmacology of

6.2.1.Analgesics - opiod and nonopiod

6.2.2.Local anesthetics

6.2.3.Haematinics and coagulants, anticoagulants

6.2.4.Vitamin d and calcium preparations

6.2.5.Antidiabetics drugs

6.2.6.Steroids

6.2.7.Antibiotics

6.2.8.Antihypertensive

6.2.9.Immunosuppressive drugs and their effects on oraltissues

6.2.10.Antiepilepticdrugs

6.3.Brief pharmacology, dental use and adverse effects of

6.3.1.General anesthetics

6.3.2.Antypsychotics

6.3.3.Antidepressants

6.3.4..Anxiolytic drugs

6.3.5.Sedatives

6.3.6.Antiepileptics

6.3.7.Antihypertensives

6.3.8.Antianginal drugs

6.3.9.Diuretics

6.3.10.Hormones

6.3.11.Pre-anesthetic medications

6.4.Drugs used in bronchial asthma cough

6.5.Drug therapy of

6.5.1.Emergencies

6.5.2.Seizures

6.5.3.Anaphylaxis

6.5.4.Bleeding

6.5.5.Shock

6.5.6.Diabetic ketoacidosis

6.5.7.Acute addisonian crisis

6.6.Dental pharmacology

6.6.1.Antiseptics

6.6.2.Astringents

6.6.3.Sialogogues

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ANNOOR DENTAL COLLEGE & HOSPITAL Muvattupuzha 686 673 Ernakulam, Puthuppady P.O.

Dr. Giju George Baby
Principal
Annoor Dental College & Hospital
Muvattupuzha - 686673

6.6.4.Disclosing agents
6.6.5.Antiplaque agents

6.7.Fluoride pharmacology

7.Biostatistics:

7.1.Introduction, definition and branches of biostatistics

7.2.Collection of data, sampling, types, bias and errors

7.3.Compiling data-graphs and charts

7.4.Measures of central tendency (mean, median and mode), standard deviation variability

7.5.Tests of significance (chi square test 't'test and Z-test)

7.6.Null hypothesis

8.Research Methodology

8.1.What is research?

8.2.What is research methodology

8.3.Study Designs

8.4.Epidemiological studies, Observations, Descriptive, Cohort case control studies.

8.5.Experimental, Clinical trials (Randomized control),
Community trends (Non randomized)

9. Infection Control

9.1.HIV and AIDS

9.2.Viral hepatitis

9.3.Aseptic techniques

9.4. Sterilization with special reference to dental office.

9.5.Dental control unit water systems and handpiece asepsis

9.6.Infection control of impressions

9.7.Cross infection

10. Dental Radiology

10.1.Introduction
10.2.Sources
10.3.Principles of x-ray production
10.4.Radiographic Principles And Technique
10.5.Advanced radiographic techniques – Subtraction radiography, CT, CBCT

11. Ethics in Dentistry

11.1.Introduction to ethics:

11.2.What is ethics?

11.3.What are values and norms?

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11.4.How to form a value system in one's personal and professional life?

11.5.Hippocratic oath.

11.6.Ethics of the Individual

11.6.1.The patient as a person

11.6.2.Right to be respected

11.6.3.Truth and confidentiality

11.6.4.Autonomy of decision

11.7.Doctor patient relationship

11.7.1.Professional Ethics

11.7.2.Code of conduct

11.7.3.Contract and confidentiality

Paper II :Etiopathogenesis

2.1.Classification of periodontal diseases and conditions

2.2. Epidemiology of gingival and periodontal diseases

2.3.Defense mechanisms of gingiva

2.4.Periodontal microbiology

2.5.Basic concepts of inflammation and immunity

2.6.Microbial interactions with the host in periodontal diseases

2.7.Pathogenesis of plaque associated periodontal diseases

2.8.Dental calculus

2.9.Role of iatrogenic and other local factors

2.10.Genetic factors associated with periodontal diseases

2.11.Influence of systemic diseases and disorders of the periodontium

2.12 .Role of environmental factors in the etiology of periodontal disease

2.13.Stress and periodontal diseases

2.14.Occlusion and periodontal diseases

2.15.Smoking and tobacco in the etiology of periodontal diseases

2.16.AIDS and periodontium

2.17. Periodontal medicine

2.18.Dentinal hypersensitivity

Paper III :Clinical and Therapeutic Periodontology and Oral Implantology

Clinical periodontology includes gingival diseases, periodontal diseases, periodontal instrumentation, diagnosis, prognosis and treatment of periodontal diseases.

3.1.GINGIVAL DISEASES

3.1.1 Gingival inflammation

3.1.2.Clinical features of gingivitis

3.1.3.Gingival enlargement

3.1.4.Acute gingival infections

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3.1.5.Desquamative gingivitis and oral mucous membrane diseases

3.1.6.Gingival diseases in the childhood

3.2. PERIODONTALDISEASES

3.2.1.Periodontal pocket

3.2.2.Bone loss and patterns of bone destruction

3.2.3.Periodontal response to external forces

3.2.4.Masticatory system disorders

3.2.5.Chronic periodontitis

3.2.6.Aggressive periodontitis

3.2.7.Necrotising ulcerative periodontitis

3.2.8.Interdisciplinary approaches

3.2.8.1.Orthodontic

3.2.8.2.Endodontic

3.2.8.3.Periodontic considerations

3.3.TREATMENT OF PERIODONTAL DISEASES

3.3.1.History, examination, diagnosis, prognosis and treatment planning

3.3.1.1.Clinical diagnosis

3.3.1.2.Radiographic and other aids in the diagnosis of periodontal diseases

3.3.1.3.Advanced diagnostic techniques

3.3.1.4.Risk assessment

3.3.1.5.Determination of prognosis

3.3.1.6.Treatment plan

3.3.1.7.Rationale for periodontal treatment

3.3.1.8.General principles of anti-infective therapy with special emphasis on infection control in periodontal practice

3.3.1.9.Halitosis and its treatment

3.3.1.10.Bruxism and its treatment

3.3.2.Periodontal instrumentation

3.3.2.1Instrumentation

3.3.2.2.Principles of periodontal instrumentation

3.3.2.3.Instruments used in different parts of the mouth

3.3.3.Periodontal therapy

3.3.3.1.Preparation of tooth surface

3.3.3.2.Plaque control

3.3.3.3.Antimicrobial and other drugs used in periodontal therapy and wasting diseases of teeth

3.3.3.4 .Periodontal management of HIV infected patients

3.3.3.5. Occlusal evaluation and therapy in the management of periodontal diseases

3.3.3.6. .Role of orthodontics as an adjunct to periodontal therapy

3.3.3.7 .Special emphasis on precautions and treatment for medically compromised patients

3.3.3.8.Periodontal splints

3.3.3.9.Management of dentinal hypersensitivity

3.3.4.Periodontal surgical phase- special emphasis on drug prescription

3.3.4.1.General principles of periodontal surgery

3.3.4.2.Surgical anatomy of periodontium and related structures

3.3.4.3.Gingival curettage

3.3.4.5.Gingivectomy technique

3.3.4.6.Treatment of gingival enlargements

3.3.4.7.Periodontal flap

3.3.4.8.Osseous surgery (resective andregenerative;

3.3.4.9.Furcation; Problem and its management

3.3.4.10.The periodontic – endodontic continuum

3.3.4.11.Periodontic plastic and esthetic surgery

3.3.4.12.Recent advances in surgical techniques

3.3.5. Future directions and controversial questions in periodontal therapy

3.3.5.1.Future directions for infection control

3.3.5.2.Research directions in regenerative therapy

3.3.5.3.Future directions in anti-inflammatory therapy

3.3.5.4.Future directions in measurement of periodontal diseases

3.3.6.Periodontal maintenance phase

3.3.6.1.Supportive periodontal treatment

3.3.6.2.Results of periodontal treatment

3.3.7.Periodontalin strumentation

3.3.7.1.Instrumentation

3.3.7.2.Principles of periodontal instrumentation

3.3.7.3.Instruments used in different parts of the mouth

3.3.8.Periodontal therapy

3.3.8.1.Preparation of tooth surface

3.3.8.2.Plaque control

3.3.8.3.Antimicrobial and other drugs used in periodontal therapy and wasting diseases

3.3.9.ORAL IMPLANTOLOGY

3.3.9.1 Introduction and historical review

3.3.9.2.Biological, clinical and surgical aspects of dental implants

3.3.9.3.Diagnosis and treatment planning

3.3.9.4.Implant surgery

3.3.9.5.Prosthetic aspects of dental implants

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3.3.9.6.Diagnosis and treatment of Peri-implant complications

3.3.9.7.Special emphasis on plaque control measures implant patients

3.3.9.9.Maintenance phase

3.3.10.MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE

Paper IV : Essay. (Essay on any of the topics in Periodontology with emphasis on recent advances.)

FIRST YEAR MDS

EVIDENCE-BASED DECISION MAKING

- Introduction to Evidence-Based Decision Making
- Assessing Evidence
- Implementing Evidence-based Decisions in Clinical Practice

THE NORMAL PERIODONTIUM

- The Gingiva
- The Tooth-Supporting Structures
- Aging and the Periodontium

CLASSIFICATION AND EPIDEMIOLOGY OF PERIODONTAL DISEASES

- Classification of Diseases and Conditions Affecting the Periodontium
- Epidemiology of Gingival and Periodontal Diseases

PHARMACOLOGY

- Drug administration – modes, physiology, toxicology of antibiotics.
    - Tetracycline. Metronidazole, Penicillins, Cephalosporins, Clindamycin, Ciprofloxacin, Macrolides, AntifungalDrugs
    - Local Drug Delivery Systems
    - Periodontal Dressing
    - Antibiotic Prophylaxis in medically compromised patients
    - Anticoagulants and Antiplatelet drugs with special reference to the periodontium
    - Antiepileptic drugs with special reference to the periodontium
    - Antihypertensive drugs with special reference to Calcium channel blockers
    - Immunosuppressive drugs. with special reference to the periodontium
- Antiseptics, disinfectants and mouthwashes.
- Analgesics and anti-inflammatory drugs
- Astringents
- General and local anesthesia – indications and contraindications premedication and anesthetics in different clinical situations.
- Condition with special reference to periodontics.
    - Nutritional Influences–
        - General
        - Vitamin A Deficiency.
        - Vitamin B Complex deficiency and the Periodontium.
        - Role of Vitamin C in the Periodontium.
        - Vitamin D, Calcium, Phosphorus and the Periodontium..
        - Vitamin E,K,
        - Protein deficiency.

        - Minerals
    - Endocrine Disorders–
        - Diabetes Mellitus,
        - Hyperparathyroidism, Hyperthyroidism
        - Sex Hormones
    - Hematologic Disorders
        - Leukaemia
        - Anaemia.
        - Agranulocytosis
        - Polycythemia.
        - Hemophilia,
        - Thrombocytopenia
    - Metal Intoxication–
        - Bismuth
        - Lead
        - Mercury
    - Otherchemicals
- Emergency drugs in dental practice.
- Calcium channel blockers.
- Immunosuppressive drugs.
- Biotransformation of drugs.
- Antibiotics sensitivity tests.

MATERIAL SCIENCE

- Foreign body reactions in tissues.
- Composite Resins and Glass Ionomer Cements.
- Biological aspects of GTR therapy.
- Biological aspects of Synthetic bone graft materials.
- Splinting ofTeeth
- Dental Implants – Various Implant Systems.

SECOND YEAR MDS

ETIOLOGY OF PERIODONTAL DISEASES

- Microbiology of Periodontal Diseases
- The role of dental calculus and other predisposing factors
- Genetic factors associated with periodontal disease
- Immunity and Inflammation: Basic Concepts
- Microbial interactions with the host in periodontal diseases
- Smoking and periodontal disease
- Molecular Biology of the host-microbe interaction in periodontal diseases: Selected Topics: Molecular signalling aspects of pathogen-mediated bone Destruction in periodontal disease
- Host Modulation

RELATIONSHIP BETWEEN PERIODONTAL DISEASE AND SYSTEMIC HEALTH

- Influence of systemic disorders and stress on the periodontium
- Periodontal medicine: impact of periodontal infection on systemic health
- Oral malodour

PERIODONTAL PATHOLOGY

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1. GINGIVAL DISEASE

- Defence mechanisms of the gingiva
- Gingival inflammation
- Clinical features of gingivitis
- Gingival enlargement
- Acute gingival infections
- Gingival diseases in childhood
- Desquamative gingivitis

2. PERIODONTAL DISEASE

- The Periodontal Pocket
- Bone Loss and Patterns of Bone Destruction
- Periodontal Response to External Forces
- Masticatory System Disorders
- Chronic Periodontitis
- Necrotizing Ulcerative Periodontitis
- Aggressive Periodontitis
- Pathology and Management of Periodontal Problems in Patients with HIV Infections

III YEAR MDS

TREATMENT OF PERIODONTAL DISEASE

1. DIAGNOSIS, PROGNOSIS AND TREATMENT PLAN

- Clinical Diagnosis
- Radiographic Aids in the diagnosis of Periodontal Disease
- Advanced Diagnostic Techniques
- Risk Assessment
- Levels of Clinical Significance
- Determination of Prognosis
- The Treatment Plan
- Rationale for Periodontal Treatment
- Periodontal Therapy in the Female Patient
- Periodontal Treatment of Medically Compromised Patients
- Periodontal Treatment for Older Adults
- Treatment of Aggressive and Atypical Forms of Periodontitis

2. TREATMENT OF PERIODONTAL EMERGENCIES

- Treatment of acute gingival disease
- Treatment of periodontal abscess

3. NONSURGICAL THERAPY

- Phase I Therapy
- Plaque control for the periodontal patient
- Scaling and root planing
- Chemotherapeutic agents
- Host modulation agents
- Sonic and ultrasonic instrumentation
- Supragingival and Subgingival Irrigation
- Occlusal Evaluation and Therapy
- Adjunctive role of Orthodontic therapy
- Periodontic- Endodontic continuum

4. SURGICALTHERAPY

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- Phase II Periodontal therapy
- General principles of Periodontal Surgery
- Surgical Anatomy of the periodontium and related structures
- Gingival Surgical Techniques
- Treatment of Gingival enlargement
- The periodontal Flap
- Flap technique for pocket therapy
- Resective osseous Surgery
- Reconstructive Periodontal surgery
- Furcation - Involvement and treatment
- Periodontal plastic and aesthetic surgery
- Recent advances in Surgical technology

5. PERIODONTAL RESTORATIVE INTERRELATIONSHIPS
   - Preparation of periodontium for restorative dentistry
   - Restorative interrelationships

ORAL IMPLANTOLOGY

1. Biological aspects of oral implants
2. Clinical aspects and evaluation of implant patient
3. Diagnostic imaging for the implant patient
4. Standard implant surgical procedures
5. Localised Bone augmentation and Implant site development
6. Advanced implant surgical procedures
7. Recent advances in implant surgical technology
8. Biomechanics, Treatment planning and prosthetic considerations
9. Implant related complications and failures

PERIODONTAL MAINTENANCE

1. Supportive periodontal treatment
2. Results of periodontal treatment

ETHICAL, LEGAL, AND PRACTICAL ISSUES IN THE MANAGEMENT OF PERIODONTAL PATIENTS

1. Dental ethics
2. Legal principles :Jurisprudence
3. Dental insurance and Managed Care in Periodontal Practice

STRUCTURED TRAINING SCHEDULE

FIRST YEAR

1 Clinical cases:

i. Practice of incision and suturing techniques on typhodont models
ii. X ray techniques and interpretations
iii. Local anesthetic techniques
iv. Basic diagnostic microbiology and immunology, collection & handling samples, culturing techniques.
v. Practical training on basic life support devices.
vi. Basic Biostatistics. Survey & data analysis.
vii. Applied periodontal Indices 10Cases
viii. Scaling & Root planing 50 cases
ix. Ultrasonic scaling 50 cases.
x. Curettage 15Cases.
xi. Local Drug Delivery 10 cases
xii. Gingivectomy & Gingivoplasty 5cases.

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2 **Seminars:** One Seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year. A minimum of 30 seminars should be attended by each student each year.
3 **Journal club**: One Journal club per week to be conducted in the department. A minimum of five journal clubs should be presented by each student each year . A minimum of 30 journal clubs should be attended by each student each year.
4 Protocol for library dissertation to be submitted on or before the end of six months from the date of admission. Library dissertation should be submitted at the end of first year.
5 Synopsis for dissertation to be submitted at the end of first year.
6 Under graduate classes: Around 4-5 classes should be handled by each post- graduate student.
7 Field survey: To be conducted and submit the report
8 Inter – department meetings: should be held once in 3months.
9 Case discussions
10 Field visits: To attend dental camps and to educate the masses
11 Basic subjects classes
12 Internal assessment or Term paper
13 Scientific paper and poster presentations at various conferences and post graduate workshops.

SECOND YEAR:

1 Clinicalwork
   i. Case history & treatment planning 5cases.
   ii. Periodontal surgical procedures 50surgeries
      a. Pocket therapy
      b. Mucogingival surgery
      c. Perio-endo problems
      d. Periosplint
      e. Occlusal adjustment
   iii. Implant - 1case
2 Seminars: One Seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year. A minimum of 30 seminars should be attended by each student each year.
3 Journal club: One Journal club per week to be conducted in the department. A minimum of five journal clubs should be presented by each student each year. A minimum of 30 journal clubs should be attended by each student each year.
4 Undergraduate classes: Each post- graduate student should handle around 4-5 classes.
5 Inter –departmental meetings: Should be held once in 3 months
6 Case discussions
7 Field visits: To attend dental camps and to educate the masses.
8 Dissertation work: On getting the approval from the university work for the dissertation to be started.
9 Scientific paper and poster presentations at various conferences and post graduate work shops.

THIRD YEAR

1 Clinicalwork
   i. Surgeries - 20
   ii. Including 10 Surgeries using Regenerative surgical techniques -graft material & membranes

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2 Seminars- One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
3 Journal Club: One Journal club per week to be conducted in the department.
4 Under graduate classes: each post –graduate student, should handle around 4-5classes.
5 Inter departmental meetings: Should be held once in a month.
6 The completed dissertation should be submitted six months before the final examination
7 Case discussions
8 Field visits: To attend dental camps and to educate the masses.
9 Finishing and presenting the cases taken up.
10 Preparation of finished cases and presenting the cases (to be presented for the examination).
11 Maintenance of record and log book of all cases done during post graduate training period
12 Mock examination

NOTE: All documents of the treated cases and seminar topics duly attested by the concerned guide should be submitted prior to the Clinical/Practical University Examination.

2.7.Total number of hours

As per the instruction given by the DCI.

2.8.Branches if any with definition

Present in clause 2.6

2.9.Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution under taking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.

- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should beensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to thecandidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by aspecialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

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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 through examination conducted at the end of the specified course. A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause2.6

2.11 No: of hours per subject (lecture-tutorial-seminar-groupdiscussion)

Present in clause2.6

2.12 .Practical training given in labs/supervision (No: of hours for eachexercise/training)

Present in clause2.6

2.13 Records

Present in clause2.20

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously

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undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

Introduction

i. Aims and Objectives of the study
ii. Review ofLiterature
iii. Methodology
iv. Results
v. Discussion
vi. Conclusion
vii. Summary
viii. References
ix. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS Website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS Website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertations are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide

requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training ifany

Present in clause2.6

2.16 .Project work to be done ifany

Present in clause 2.6

2.17. Any other requirements [CME, Paper Publishingetc.]

Present in clause2.6

2.18. Prescribed/recommended textbooks for eachsubject

Applied Basic Sciences

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
	Ash, Major M	Wheelers Dental Anatomy, Physiology and Occlosion

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Oral Anatomy	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmachology
	Hardman, Joel G	Goodman and Gillmans
		pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Periodontology

1. Clinical Periodontology,10th Edition — Fermin A.Carranza Jr. Michael G. Newman
2. Contemporary Periodontics — Genco
3. Decision making in Periodontology,3rd edn — Walter BurnellHall
4. Periodontology color guide — Heasman, Preshaw,Smith
5. Essentials of Periodontics,4th edition — Hoag
6. Outline of Periodontics — J. D. Manson, B. M.Eley
7. Colour atlas of Periodontal Surgery — Jeffrey DJohnson
8. Periodontal Medicine, Surgery and Implants — Louis F Rose, Brian L Mealey,Robert G Jenco, D Walter Cohen
9. Contemporary Periodontal Instrumentation — DianeSchoen
10. Clinical Guide to Periodontics — Murray Schwartz
11. Periodontics- in the tradition of Gottlieb& — D A Grant, Irving BSterm
12. Orban — Max A Listgarten
13. Clinical Periodontology and Implant Dentistry — JanLindhe
14. Geriatric Dentistry- Ageing and oral health — Ash & Ramfjord
15. Occlusion — Mash & Marcus L Ward

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16. Evaluation, Diagnosis and Treatment of occlusal problems — Dawson
17. Implant Prosthodontics Clinical & Laboratory Procedures — Fagan
18. Implant Prosthodontics Surgical & Prosthetic Procedures — Fredrickson
19. Endosteal Dental Implants — McKinney
20. Contemporary Implant Dentistry — CEMisch
21. Change your Smile — Goldstein
22. Successful Restorative Dentistry — Prof. A. D.Wamsley
23. The Periodontal Ligament in Health and Disease — Berkovitz, B. J. Moxham, H.N. Newman
24. History of Dentistry — Hoffman/Asthet
25. Anatomical atlas of TMJ — Ide/Nakazann
26. Text book of occlusion — Moh/ Zarb/CasternRogh
27. Essentials of clinical periodontology and periodontics – ShanthipriyaReddy
28. Periodontics-medicine surgery and implants — Brean.l.Mealy,Louis.F.Rose
29. Clinical Periodontology-Current concepts — Dr.B.R.R.Varma&R.P.Nayak
30. Text book of Periodontology — Dr.GururajaRao
31. Color Atlas Of Dental Medicine: Periodontology — WolfRateitschak-Pluss, Rateitschak-Hassell
32. Plastic - Esthetic Periodontal and Implant Surgery — Otto Zuhr MarcHurzeler
33. Periodontal Surgery: A Clinical Atlas of Mucogingival Esthetic surgery — NaoshiSato, Giovanni Zucchelli

2.19. Reference books

As recommended by the HOD

2.20 Journals

1. Journal of Periodontal Research
2. Journal of Periodontology
3. Journal of Oral Implantology
4. Journal of Clinical Periodontology
5. Periodontology2000
6. I.S.P Journal
7. International journal of oral implantology and clinical research
8. International journal of clinical implant dentistry
9. International Journal of Periodontics and Restorative Dentistry
10. British Dental Journal
11. Journal of American Dental Association
12. Dental Clinics of North America
13. Dental Quintessance
14. Australian Dental Journal
15. Journal of Indian Dental Association

2.21.Log book

- **Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

3 EXAMINATIONS

3.1.Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is a mandatory requirement for the candidate to appear for the university examinations.

Library Dissertation

Submission of library dissertation as per the regulations of DCI / KUHS is mandatory for a candidate to appear for the university examinations.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her

participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on the checklist given in 5.1 to5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2.Schedule of Regular/Supplementary exams

The MDS examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3. Scheme of examination showing maximum marks and minimum marks

MDS examination will consist of Written (Theory), Viva Voce, and Practical / Clinical examinations.

Written Examination (Theory) :300 Marks

Written examination shall consist of **four question papers**, each of three hours' duration. Each paper shall carry 75 marks. The type of questions in the first three papers will be two long essay questions carrying 20 marks each and five short essay questions each carrying seven marks. **There will be no options in the questions in the first 3 papers. Fourth paper will be a single essay question paper which will carry an option and the candidate is to answer only one of the essays.** Questions on recent advances may be asked in any or all the papers. **The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.** The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the theory examination shall be 300.

Practical Examination : 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce :100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

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3.4.Papers in the examination

Paper-I - Applied Anatomy, Physiology, Biochemistry, Pathology and pharmacology
Paper-II- Etiopathogenesis
Paper-III- Clinical Periodontology and Oral Implantology
Paper-IV -Essay

3.5. Details of Theory examination

Distribution of topics for each paper will be as follows:

Paper I: Applied Basic Sciences: Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.
Paper II: Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics
Paper III: Periodontal diagnosis, therapy & Oral implantology
Paper IV: Essay (with emphasis on recent advances in periodontics)

3.6. MODEL QUESTION PAPERS

MDS Periodontology

PAPER I – Applied Anatomy, Physiology, Biochemistry, Pathology, Microbiology, Pharmacology and Biostatistics

(Answer all questions)

Time: 3 hrs Maximum marks75

Long Essays **(2 x 20 =40marks)**

1. Describe the anatomy, histology and clinical relevance of cementum. Add a note on pathologies affecting cementum
2. Enumerate blood-clotting factors. Describe the mechanism of blood clotting after periodontal surgery

Short essays **(5x7=35marks)**

3. Sterilization and disinfection.
4. Vitamin C
5. HIV infection and periodontal consideration.
6 Tetracyclines.
7. Cohort Study.

PAPER II –Etiopathogenesis of Periodontal Diseases

(Answer all questions)

Time: 3hrs Max marks:75

Long essays **(2 x 20= 40 marks)**

1. Discuss genetic factors associated with periodontal disease.
2. Discuss the risk factors for aggressive periodontitis

Short essays (5x7=35marks)

3. Etiological factors and impact of smoking in periodontal disease
4. Microorganisms associated with specific periodontal disease
5. Describe chemotaxins for neutrophils
6. Molecular characterization of gingipain protease genes
7. Segregation analysis of early onset periodontitis

PAPER III – – Clinical Periodontology and Oral Implantology

(Answer all questions)

Time: 3 hrs Maximum marks75

Long essays **(2 x 20 = 40marks)**

1. Describe principle of sonic and ultra-sonic instruments.
2. Describe the process of Osseo integration and the reasons for its failure.

Short essays **(5x7=35)**

3. Radiosurgery techniques and instruments
4. Matrix metalloproteinases
5. Burnout phenomenon
6. Implant bone interface
7. Guided bone regeneration

PAPER IV – Essay on Recent Advances in Periodontics

(Answer only one question)

Time:3 hours Max marks : 75

Evidence Based Periodontal Therapy

OR

Critically analyze the statement 'guided tissue regeneration with barrier membranes is not a total solution for periodontal reconstitution.'

3.7. Internal assessment component

Not applicable.

3.8. Details of practical/clinical exams

The clinical examination shall be of two days duration

1st day

Case discussion

- Long case-One
- Short case -Two

Periodontal surgery - Periodontal flap surgery on a previously prepared case in one quadrant of the mouth after getting approval from the examiners

2nd day

Post-surgical review and discussion of the case treated on the 1st day
Presentation of pedagogy/dissertation.
All the examiners shall participate in all the aspects of clinical examinations / Viva Voce
Distribution of Marks for Clinical examination (recommended)

a) Long Case discussion	50
b) 2 short cases	50
c) Periodontal surgery	75
d) Post — operative review	25
Total	200

3.9. Number of examiners needed (Internal & External) and their qualifications

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10. Details of viva:

Viva Voce :100 Marks

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i. Viva-Voce examination : 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

iii. Pedagogy and thesis presentation : 10 +10 = 20 marks

4. INTERNSHIP

Not applicable in PG Courses

5. ANNEXURES

5.Check Lists for Monitoring: Log Book, Seminar Assessment etc.

CHECKLISTS and LOGBOOK

5.1: Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student: Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer to questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty-in-charge

5.2:Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student: Date:

Name of the Faculty/Observer:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of **Faculty/Observer**

5.3:Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student: Date:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extraoral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Observer

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Dr. Giju George Baby
Principal
Annoor Dental College & Hospital
Muvattupuzha - 686673

5.4 :Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
9	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/Guide

5.5:Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student: Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score	Performance	Score
1	Interest shown in selecting topic		Poor	0
2	Relevance of Topic		Below Average	1
3	Preparation of Proforma		Average	2
4	Appropriate review		Good	3
5	Appropriate Cross references		Very good	4
6	Periodic consultation with guide/co- guide			
7	Depth of Analysis / Discuss			
8	Ability to respond to questions			
9	Department Presentation of findings			
10	Quality of final output			
	TOTAL SCORE			

Signature of Faculty/Guide/Co-guide

5.6:CHECKLIST-6

CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of theTrainee: Date

Name of the Faculty/Observer:

Sl.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1.	Periodic consultation with guide / co- guide					
2.	Regular collection of case material					
3.	Depth of Analysis / Discussion					
4.	Department presentation of findings					
5.	Quality of final output					
6.	Others					
	Total score					

Signature of the guide / co-guide

5.7 :CHECKLIST -7

OVER ALL ASSESSMENT SHEET

Name of the College: Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2.	Journal Review Presentation			
3.	Seminars			
4	Library dissertation			
5.	Clinicalwork			
6-	Clinicalpresentation			
7.	Teaching skill practice			
8.	Dissertation			
	TOTAL			

Signature of HOD **Signature ofPrincipal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Dr. Cyril George Baby
Principal
Annoor Dental College & Hospital
Muvattupuzha - 686673

5.8:LOGBOOK

DEPARTMENT OF .....

MDS Programme

LOG BOOK OF

NAME.....

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

i. FIRST YEAR

ii. SECOND YEAR

iii. THIRD YEAR

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

5.8.1 :LOG BOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

Date	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching	Particulars

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5.8.2 :LOG BOOK -2

ACADEMIC PRESENTATIONS MADE BY THE TRAINEE

Name :

Admission Year:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

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5.8.3 :LOGBOOK-3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

AdmissionYear:

College:

Date	Name	OP No.	Procedure	Category O, A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A-ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI-PERFORMED INDEPENDENTLY - III YEAR MDS

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REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Conservative Dentistry and Endodontics

Course Code: 244

(2016-17 Academic year onwards)

2016

- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Conservative Dentistry and Endodontics deals with the etiology, diagnosis, prevention and treatment of the diseases and injuries of the hard dental tissues, pulp of the tooth and associated periapical conditions.

2.5 Duration

The course shall be of **three years'** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Subjects

Syllabus for MDS – Conservative Dentistry and Endodontics
The syllabus for the theory of Conservative Dentistry and Endodontics should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be in corporated in all relevant areas.

Course Contents

Paper I : Applied Anatomy, Physiology, Pathology and Dental materials

1.DENTAL MATERIALS

1.1. Categories of Dental Materials

1.1.1.Direct and indirect materials

1.1.2.History of restorative materials

1.2.Structure of Matter

1.2.1Primary and secondary bonding

1.2.2.Crystalline and non crystalline

structure 1.2.3.Adhesion and bonding

1.3.Physical Properties

1.3.1.Abrasion resistance, viscosity, creep, flow, color

1.3.2.Tarnish and corrosion

1.4.Mechanical Properties

1.4.1.Stress and strain

1.4.2. Elastic deformation

1.4.3. Strength – different types

1.4.4. Toughness, brittleness, ductility and malleability, hardness

1.5. Solidification and Microstructure of Pure Metals and Alloys

1.5.1. Metallic bond

1.5.2. Solidification of metals. Grain size

1.5.3. Solid solutions

1.5.4. Equilibrium phase diagram

1.5.5. Coring, homogenization, dendrite formation

1.5.6. Eutectic alloys, peritectic alloys, solid state reactions

1.6. Polymer Science

1.6.1. Classification, chemistry, physical properties, types, copolymerization

1.7. Biocompatibility

1.7.1. Adverse effects of dentalmaterials

1.7.2. Measuring biocompatibility

1.7.3. Responses to specific materials

1.8. Impression Materials

1.8.1. Elastomeric impression materials–composition, chemistry, properties, manipulation

1.8.2. Hydrocolloids

1.8.3. Alginate, impression compound, impression pastes

1.9. Gypsum products

1.9.1. Types, composition, setting reaction, properties

1.10. Inlay Casting Wax

Types, composition, properties, flow, manipulation.

1.11. Casting Investments and Procedures

1.11.1. Types, composition, setting expansion

1.11.2. Die materials, sprue, casting ring liner, investing and casting procedures, defective casting

1.12. Burs, Abrasives, Dentifrices

1.12.1. Principles of cutting, types

1.13. Bonding and Restorative Resins

1.13.1. Acid etch technique, bonding agents, pit and fissure sealants

1.13.2. Composites. Classification, composition, properties, polymerization,

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finishing and polishing

1.13.3.Posterior composites, Indirect composites and composite veneers

1.14.Dental Cements

1.14.1.Classification, composition, properties, uses

1.14.2.Liners and varnishes

1.15.Dental Amalgam

1.15.1.Composition, manufacture, properties, advantages and disadvantages

1.15.2.Steps in placement, mercury hygiene

1.16.Direct Filling Gold

1.16.1. Forms, removal surface impurities, compaction

1.17. Casting Alloys

1.17.1 Classification. Noble and base metal alloys.

1.18.Dental Ceramics

1.18.1. Classification, methods of strengthening, metal ceramics

1.18.2.Newer materials

1.19.Bio ceramic materials

1.19.1.Bioceramic cements

1.19.2.Bioceramic sealers

1.20. Emerging technologies

1.20.1. Nanotechnology
1.20.2. Bone-grafting materials
1.20.3. Stimulus - responsive "SMART" materials
1.20.4. Materials in Regenerative dentistry
1.20.5. Computer driven fabrication systems

2.Applied Anatomy of Head and Neck

2.1 Development of face, paranasal sinuses and the associated structures and their anomalies.

2.2 Cranial and facial bones.

2.3 TMJ anatomy and function

2.4 Arterial and venous drainage of head and neck

2.5 Muscles of face and neck including muscles of mastication and deglutition

2.6 Brief consideration of structures and function of brain.

2.7 Brief consideration of all cranial nerves and autonomic nervous system of head and neck.

2.8 Salivary glands – structure, function and clinical considerations.

2.9 Functional anatomy of mastication, deglutition and speech.

2.10 Detailed anatomy of permanent teeth, general consideration in physiology of permanent dentition, form, function, alignment, contact, occlusion.

2.11 Internal anatomy of permanent teeth and its significance

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2.12 Applied histology, histology of skin, oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

3. Development of Teeth

3.1 Enamel-development and composition, physical characteristics, chemical properties, structure, Age changes- clinical structure, clinical considerations.

3.2 Dentin-development, physical and chemical properties, structure type of dentin, innervations, age and functional changes, clinical considerations.

3.3 Pulp-development, histological structures, innervations, functions, regressive changes, clinical considerations.

3.4 Cementum-composition, cementogenesis, structure, function, clinical consideration.

3.5 Periodontal ligament-development, structure, function and clinical consideration.

4.Applied Physiology

4.1 Mastication, deglutition, digestion and assimilation.

4.2 Fluid and electrolyte balance.

4.3 Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion.

4.4 Circulation, heart, pulse, blood pressure, shock.

4.5 Respiration, control, anoxia, hypoxia, asphyxia, artificial respiration.

4.6 Calcium and phosphorous metabolism.

4.7 Physiology of saliva - composition, function, clinical significance.

4.8 Clinical significance of vitamins, diet and nutrition – balanced diet.

4.9 Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders - typical and atypical.

4.10 Biochemical tests and their significance.

4.11 Enzymes, vitamin and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine.

5.Pathology

5.1 Inflammation, repair, degeneration, necrosis and gangrene.

5.2 Circulatory disturbances - ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.

5.3 Neoplasms - classifications of tumors, characteristics of benign and malignant tumors, spread tumors.

5.4 Blood dyscrasias

5.5 Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures. Bacterial, viral, mycotic infections of the oral cavity.

5.6 Cysts and tumours of oral cavity

5.7 Wound and fracture healing.

6.Microbiology

6.1 Microbes of relevance to dentistry - streptococci, staphylococci, lactobacilli, cornyebacterium, actinomycetes, Clostridium, neisseria, vibrio, bacteriods, fusobacteria, spirochetes, mycobacterium, virus and fungi.

6.2 Pathways of pulpal infection, oral flora and microorganisms associated with endodontic

diseases, pathogenesis.

6.3 Host defense, bacterial virulence factors, healing,theory of focal infections.

6.4 Cross infection, infection control, infection control procedure, sterilization and disinfection.

6.5 Immunology - antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, autoimmunity, grafts, viral hepatitis, HIV infections and AIDS

6.6 Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique Microscopy, Immunological Methods, Molecular biology techniques (PCR, DNA-DNA Hybridisation, Denaturing Gradient Gel Electrophoresis, Terminal-RFLP, DNA Microarrays, Fluorescence In Situ Hybridization)

6.7 Aerobic and anaerobic interpretation and antibiotic sensitivity test.

7. Pharmacology

7.1. General pharmacology

7.1.1.. Definitions - Pharmcokinetics with clinical applications, routes of administration including local drug delivery in endodontics

7.1.2.. Adverse drug reactions and drug interactions

7.2. Detailed pharmacology of

7.2.1.. Analgesics - opioid and nonopioid
7.2.2. Local anesthetics
7.2.3. Haematinics and coagulants, anticoagulants
7.2.4. VitD and calcium preparations
7.2.5. Antidiabetic drugs
7.2.6.. Steroids
7.2.7. Antibiotics
7.2.8. Antihypertensives
7.2.9. Immunosuppressive drugs and their effects on oral tissues
7.2.10. Antiepileptic drugs
7.2.11. Anti histamines
7.2.12. Anti sialagogues
7.2.13. Anti virals

7.3. Brief pharmacology, dental use and adverse effects of

7.3.1. General anesthetics
7.3.2. Antypsychotics
7.3.3. Antidepressants
7.3.4. Anxiolytic drugs
7.3.5. Sedatives
7.3.6. Antiepileptics
7.3.7. Antihypertensives
7.3.8. Antianginal drugs
7.3.9. Diuretics
7.3.10. Hormones
7.3.11. Pre-anesthetic medications

7.4. Drug therapy of

7.4.1. Emergencies
7.4.2. Seizures
7.4.3. Anaphylaxis
7.4.4. Bleeding
7.4.5. Shock

7.4.6. Diabetic ketoacidosis
7.4.7. Acute Addisonian crisis

7.5. Dental Pharmacology

7.5.1. Antiseptics and disinfectants
7.5.2.. Astringents
7.5.3.. Sialogogues
7.5.4. Disclosing agents
7.5.5. Antiplaque agents
7.5.6. Dentrifices
7.5.7. Artificial saliva

7.6. Fluoride pharmacology

7.7. Pharmacology of re - mineralizing agents

7.Biostatistics

7.1 Introduction, Basic concepts, Types of data. Compilation and presentation of data.

7.2 Health information systems - collection, compilation, presentation ofdata.

7.3 Measures of central tendency, measures of dispersion. Normal distribution.

7.4 Methods of sampling.

8.5. Estimation and hypothesis testing. Standard error, confidence interval, P value, Type I, II errors. Tests of significance - parametric (*z* test, t test, paired t test, analysis of variance) and non-parametric tests. (Mann Whitney U test, Kruskal-Wallis test, chi squared test)

8.6 Correlation and regression.

8.7 Developing a protocol. Epidemiologic(descriptive and analytic)study designs

8.8 Determining cause-effect relationship. Odds ratio and relative risk, prognosis.

8.9 Bias and confounding.

8.10 Sample size calculation and power.

8.11 Sensitivity and specificity.

9 Research Methodology

9.1. Essential features of a protocol for research in humans
9.2. Experimental and non-experimental study designs
9.3. Ethical considerations of research

Paper II : CONSERVATIVE DENTISTRY & AESTHETIC DENTISTRY

1. Introduction to Operative Dentistry

1.1. Definition, history

2. Dental Anatomy, Histology, Physiology, Occlusion

3. Cariology, Etiology, Prevention and Control

3.1. Definition, hypotheses, classification.

3.2. Plaque. Definition, pathophysiology, clinical characteristics, histopathology

3.3. Caries diagnosis, prevention, treatment, recent advances

3.4. Probiotics

4. **Enamel and Dentin Adhesion**

4.1. Challenges to dentin bonding

4.2. Hybridlayer

4.3. Dentin bonding agents

5. **Tooth preparation**

5.1. Terminology

5.2. Stages and steps in cavity preparation

5.3. Factors affecting tooth preparation

6. Instruments and Equipment for Tooth Preparation

6.1. Hand cutting instruments

6.2. Powered cutting equipment

6.3. Rotary cutting instruments – burs and abrasives

6.4. Hazards with cutting instruments

6.5. Alternative methods for tooth preparation

7. Infection Control

7.1. HIV and AIDS

7.2. Viral hepatitis

7.3. Aseptic techniques

7.4. Sterilization

7.5. Dental control unit water systems and hand piece asepsis

7.6. Infection control of impressions

8. **Patient Examination, Diagnosis and Treatment Planning**

8.1. Patient assessment

9. **Initial steps prior to treatment**

9.1. Patient and operator position

9.2. Pain control – newer techniques.

9.3. Isolation of operating field

10. **Material Considerations in Composite Restorations**

10.1. Properties

10.2. General considerations

10.3. Clinical technique

11. **Class I to Class VI Composite Restorations**

11.1.Tooth preparation, adhesive application, incremental placement and polymerization techniques

11.2.Matrix systems for composites, contact forming instruments, special placement methods, alternative polymerization techniques..

12. **Tooth Colored Inlays and Onlays**

12.1. preparation, impression, provisional restoration, cementation.

13. **Other Conservative Esthetic Procedures**

13.1. Aesthetics and golden proportion

13.2. Bleaching

13.3. Veneers and resin bonded splints

13.4. Conservative bridges

14. **Advanced Aesthetic dentistry**

14.1.Color and Shade selection and matching
14.2.Ultra conservative restorative dentistry
14.3.Clark's preparation for posterior composite restorations
14.4.Finishing and Polishing
14.5.Facial and Dental proportions
14.6.Emergence profiles
14.7.Smile design
14.8.Diastema closure
14.9.Direct and Porcelain veneers
14.10.Esthetic posts and cores
14.11.Perioesthetics
14.12.Orthoesthetics

Dr. Gijo George Baby
Principal

14.13.Endoesthetics

15.General Considerations for Amalgam restorations

16.Class I to Class VI Amalgam

16.1.Indications and contraindications

16.2.Advantages and disadvantages

16.3.Clinical technique

16.4.Restoration procedures

17.Complex Amalgam Restorations

17.1. preparation, pin retained restorstion

18.Cast Metal Restorations

18.1.Indications and Contraindications

18.2.Advantages and Disadvantages

18.3.Clinical Technique

18.4.Impression taking and fabrication

18.5.Cementation of the restoration

19.Direct Gold Restoration.

20.Lasers and its applications.

21.Minimal Invasive Dentistry.

22. Management of non carious lesions

23. Hypersensitivity theories, causes & management

24. CAD CAM & CAD CIM in restorative dentistry

25. Dental imaging and its application in restorative dentistry

26. Case documentation

26.1 Dental photography

27. Nanoparticles in Restorative dentistry

Paper III : ENDODONTICS

1. **Pulp development, structure & function**

1.1. Pulp & dentin development, structure

1.2. Dentin sensitivity and painful pulpitis

1.3. Vital pulp therapy

2. **Pulpal Reaction to Dental Caries & Dental Procedures**

2.1. Dental caries and sequelae

2.2. Reaction of pulp to local anaesthetics, cavity and crown preparation

2.3. Reaction of pulp to restorative materials

2.4. Periapical pathology

3. **Microbiology and Immunology**

3.1. Role of bacteria in pulpal and periradicular diseases

3.2. Pathways of pulpal and periapical infections

3.3. Flora of root canal and periradicular space

3.4. Endodontic biofilm

3.5. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique, Microscopy, Immunological Methods, Molecular biology techniques.

3.6. Aerobic and anaerobic interpretation and antibiotic sensitivity test

4. **Endodontic Diagnosis**

4.1. History Taking

4.2. Examination and Testing

4.3. Clinical Classification of Pulpal and Periapical Diseases

4.4. Referred Pain

5. **Instruments, Materials and Devices**

5.1. Classification of instruments & materials

5.2. Instruments for root canal preparation

5.3. Physical and mechanical properties of hand instruments

5.4. Instruments for sealing the root canal

5.5. Auxiliary instruments & devices

5.6. Endosonics (Ultrasonic)

5.7. Greater taper instruments

5.8. Rotary endodontic system

5.9. Reciprocating endodontic systems

5.10. Endodontics materials - core and sealer materials

5.11. Lasers

5.12. Instruments in Endodontic micro surgery.

5.13. Magnification in endodontics.

5.14. Calcium Silicate based materials

6.Endodontic Emergencies

6.1. Diagnosis and management.

7.Non-odontogenic Facial Pain

8.Cases Selection and Treatment Planning

8.1. Evaluation of patient

8.2. Evaluation of the tooth

8.3. Treatment planning

9.Preparation for Treatment

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9.1.Preparation of patient

9.2.Preparation of operatory

9.3.Isolation of tooth

9.4. Pain control

10.Endodontic radiography

10.1.Intra oral radiography - routine, modified and special views

10.2.Digital Imaging

10.3.CBCT and Micro CT in endodontics

10.4. Ultrasound

11.Armamentarium and Sterilization

12.Tooth Morphology and Access Preparation

12.1.Tooth anatomy and its relation

12.2. Ideal access, guidelines, principles, special instruments, illumination and magnification

12.3.Access preparation for individual tooth, modifications.

12.4.Access preparation in calcified pulp chambers, complex restorations and ceramic crowns

13.Cleaning and Shaping the Root Canal System

13.1.Working length determination

13.2.Instrumentation methods

13.3.Instrumentation techniques

13.4.Engine driven, power driven, sonic and ultrasonic instruments

13.5.Smear layer in endodontics and its importance

13.6.Iatrogenic complications during cleaning and shaping canal

14.Root Canal Disinfection

14.1. Irrigants, techniques, devices, recent advances

14.2.Photodisinfection – principle, protocols

14.3. Intra canal medicaments

15.Obturation of the Root Canal System

15.1.Objectives of canal obturation

15.2.Techniques of obturation using different types of filling materials and sealers

15.3.Newer techniques of obturation

15.4.Healing of periapical tissue following obturation

16.Endodontic Traumatology

16.1.Traumatic injuries

16.2.Classification and treatment

16.3.Crown fractures - fracture of enamel, fracture involving dentin, fracture involving the pulp, pulp

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capping, pulpotomy, apexogenesis, follow up

16.4.Root fractures,diagnosis,types, management, healing of fracturedroots, follow up.

16.5 Treatment of fractured root not communicating with oral cavity, pulp obliteration, apexification.

16.6.Treatment of fractured root communicating with the oral cavity.

16.7.Minor fractures of alveolar –process

16.8.Subluxation, avulsion and replantation

16.9.Splinting of teeth

16.10.Prevention of traumatic injuries to teeth.

16.11.Cracks and Fractures of teeth

17. Fracture mechanics

17.1.Cracked and Fractured cusps

17.2.Cracked and split tooth

17.3.Vertical root fracture

18.Root Resorption

18.1.Definition,causes

18.2.External root resorption and management

18.3.Internal root resorption and management

18.4.Systemic causes of root resorption

19.Endodontic – Periodontic Interrelationship

19.1.Effect of pulpal disease on periodontium

19.2.Effect of endodontic treatment on periodontium

19.3.Effect of periodontal disease and its treatment on pulp

20.Endodontic – Orthodontic Interrelationship

20.1.Effect of orthodontic treatment on pulp and root morphology

20.2.Orthodontic extrusion of tooth for endodontic treatment

21.Surgical Endodontics

21.1.Definition, scope and prognosis

21.2.Contraindications and indication

21.3.Pre-surgical work up

21.4.Soft tissue management in endodontic surgery

21.5.Hard tissue management

21.6.Root resection and retro filling procedures

21.7.Post operative complication and management

21.8.Magnification and recent advances in endodontic surgery

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22.Bleaching of Vital and Pulpless teeth

22.1.Case selection for bleaching and contraindications

22.2.Causes of discoloration – extrinsic and intrinsic

22.3.Micro abrasion technique

22.4.In office bleaching of vital teeth

22.5.Bleaching pulpless teeth

22.6.Night guard vital bleaching

23.Pediatric & Geriatric Endodontics

24.Endodontic Failure and Treatment

24.1.Extent of Endodontic failures

24.2.Criteria for evaluating treatment results

24.3.Causes of endodontic failures

24.4.Retreatment of endodontic failures

24.5.The Apexum Procedure.

25.Endodontic implants

25.1.Material systems, techniques,types.

26.Pre and Post Endodontic Restorations

26.1. Materials, concepts, procedures.

26.2. Anatomical, biological and mechanical considerations for post endodontic restorations.

26.3. Post and cores- materials, types, fabrication.

27.Regenerative endodontics

27.1.Pulp Regeneration

27.2. Stem cells, Scaffolds and Growth factors

27.3. Revascularization

28. Nanoparticles in Endodontics

28.1. characteristics, use in endodontic disinfection- irrigants, medicaments, sealers, obturating materials, biofilm elimination, endodontic posts

29. Endodontic retreatment

29.1. rationale, nonsurgical and surgical retreatment

29.2. coronal disassembly,removal of obturation materials

29.3. separated instrument removal, post removal, locating missed canals

29.4. managing procedural errors, perforation repair.

30. Evaluation of endodontic treatments

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PAPER IV : ESSAY

A 3 hour essay from the syllabus on Conservative Dentistry and Endodontics with emphasis on recent advances.

PRE-CLINICAL EXERCISES

1. Exercises on Plaster Models

1.1. For Amalgam Restorations

1.1.1. Class II cavity, MO with distal pit and palatal extension on 16.

1.1.2. Class II MOD cavity with distal cusp capping on36.

1.1.3. Class II distal cavity on36.

1.1.4. Class II distal cavity, conventional, on36.

1.2. For Cast Restorations

1.2.1. Class II Box Preparation on 36.

1.2.2. Class II Modified Slice on36

1.2.3. Class II Modified flare on36

1.2.4. Onlay preparation with missing buccal cusps on36

1.3. For Acid – Etch Restorations

1.3.1. Class III typical cavity on11

1.3.2. Class III with lingual wall missing on 11

1.3.3. Class IV with both line angles missing on 11

2. Exercises On Typodont

2.1. Class II amalgam

2.1.1. Conservative MO on16

2.1.2. Conservative DO on46

2.1.3. Conservative MOD on36

2.1.4. Conventional MO on26

2.1.5. Conventional DO on36

2.1.6. Conventional MOD on46

2.2. Inlay cavity preparations

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Orthodontics and Dentofacial Orthopaedics

Course Code:245

(2016-17 Academic year onwards)

2016

15.1.2 Band pinching, welding brackets and buccal tubes to the bands

15.1.3 Stage-I

15.1.4 Stage-II

15.1.5 Pre Stage-III

15.1.6 Stage-III

15.2 Pre Adjusted Edgewise

15.2.1 Bonding full upper and lower arches

15.2.2 Upper/lower 016/018 continuous archwires with reverse curves

15.2.3 Making first, second and third order bends

15.2.4 .019x.025 stainless steel arch wires with soldered hook formation and putting reverse curves

15.2.5 Fabrication of U loop, Tear drop loop, T loop and putting alpha-beta bends

Orthodontic Topics

The under mentioned topics will be part of study in 3 year course. The educational methods recommended are: seminars, and workshops, review of literature and auto tutorials/ self-learning packages.

The syllabus for the theory of Orthodontics should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be incorporated in all relevant areas.

Paper-I : Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

1. APPLIED ANATOMY:

1.1 Prenatal growth of head:

Stages of embryonic development, origin of head, origin of face, origin of teeth.

1.2 Postnatal growth of head:

Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, face growth.

1.3 Bone growth:

Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgenographic appearance of bone

1.4 Assessment of growth and development:

Growth prediction, growth spurts, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.

1.5 Muscles of mastication:

Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion

1.6 Development of dentition and occlusion:

Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.

1.7 Assessment of skeletal age

The carpal bones, carpal x – rays, cervical vertebrae

2. PHYSIOLOGY:

2.1 **Endocrinology and its disorders**

(Growth hormone, thyroid hormone, parathyroid hormone, ACTH) pituitary gland hormones, thyroid gland hormones, parathyroid gland hormones

2.2 **Calcium and its metabolism**

2.3 **Nutrition-metabolism and their disorders**: proteins, carbohydrates, fats, vitamins and minerals.

2.4 **Muscle physiology**

2.5 **Craniofacial Biology**: Cell adhesion molecules and mechanism of adhesion

2.6 **Bleeding disorders: Hemophilia**

3. DENTAL MATERIALS:

3.1 **Gypsum products:** dental plaster, dental stone and their properties, setting reaction etc.

3.2 **Impression materials:** impression materials in general and particularly of alginate impression material.

3.3 **Acrylics:** chemistry, composition physical properties

3.4 **Composites**: composition types, properties setting reaction

3.5 **Banding and bonding cements**: Zn (PO4)2, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass Ionomer cements

3.6 **Wrought metal alloys**: deformation, strain hardening, annealing, recovery, recrystallization,

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grain growth, properties of metal alloys

3.7 **Orthodontic arch wires**: stainless steel gold, wrought cobalt chromium nickel alloys, alpha & beta titanium alloys , Nitinol, Aesthetic wires, Newer archwires

3.8 **Elastics:** Latex and non-latex elastics.

3.9 **Applied physics**, Bioengineering and metallurgy.

3.10 **Specification and tests methods** used for materials used in Orthodontics

3.11 **Survey of all contemporary literature and Recent advances in above – mentioned materials.**

4. GENETICS:

4.1 Cell structure, DNA, RNA, protein synthesis, cell division

4.2 Chromosomal abnormalities

4.3 Principles of orofacial genetics

4.5 Genetics in malocclusion

4.6 Molecular basis of genetics

4.7 Studies related to malocclusion

4.8 Recent advances in genetics related to malocclusion

4.9 Genetic counseling

4.10 Bioethics and relationship to Orthodontic management of patients.

5. PHYSICAL ANTHROPOLOGY:

5.1 Evolutionary development of dentition

5.2 Evolutionary development of jaws.

6. PATHOLOGY:

6.1 Inflammation

6.2Necrosis

7. BIOSTATISTICS:

7.1 Statistical principles

7.2 Data Collection

7.3 Method of presentation

7.4 Method of Summarizing

7.5 Methods of analysis – different tests/errors

7.6 Sampling and Sampling technique

7.7 Experimental models, design and interpretation

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7.8 Development of skills for preparing clear concise and cogent scientific abstracts and publication

8. APPLIED RESEARCH METHODOLOGY IN ORTHODONTICS:

8.1 Experimental study designs

8.2 Animal experimental protocol

8.3 Principles in the development, execution and interpretation of methodologies in Orthodontics

8.4 Critical Scientific appraisal of literature.

9. APPLIED PHARMACOLOGY

9.1 Pain management in Orthodontics

9.2 Effect of medications in Orthodontics

10. Ethics

10.1.Introduction to ethics
10.2. What is ethics?
10.3. What are values and norms?
10.4. How to form a value system in one's personal and professional life?
10.5.Hippocratic oath.
10.6.Ethics of the Individual
- 10.6.1. The patient as a person
- 10.6.2.Right to be respected
- 10.6.3 Truth and confidentiality
- 10.6.4 Autonomy of decision
- 10.6.5 Doctor patient relationship

10.7. Professional Ethics
- 10.7.1 Code of conduct
- 10.7.2 Contract and confidentiality

Paper II: Orthodontic history, Concepts of Occlusion and Esthetics, Child and Adult Psychology, Etiology and classification of malocclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics

2.1 ORTHODONTIC HISTORY:

2.1.1 Historical perspective,

2.1.2 Evolution of orthodontic appliances,

2.1.3 Pencil sketch history of Orthodontic peers

2.1.4 History of Orthodontics in India

2.2 CONCEPTS OF OCCLUSION AND ESTHETICS:

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2.2.1 Structure and function of all anatomic components of occlusion,

2.2.2 Mechanics of articulation,

2.2.2.1Recording of masticatory function,

2.2.2.2 Diagnosis of Occlusal dysfunction,

2.2.2.3 Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

2.3 ETIOLOGY AND CLASSIFICATION OF MALOCCLUSION:

- A comprehensive review of the local and systemic factors in the causation of malocclusion
- Various classifications of malocclusion

2.4 DENTOFACIALANOMALIES:

- Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

2.5 CHILD AND ADULT PSYCHOLOGY:

- Stages of child development.
- Theories of psychological development.
- Management of child in orthodontic treatment.
- Management of handicapped child.
- Motivation and Psychological problems related to malocclusion /orthodontics
- Adolescent psychology
- Behavioral psychology and communication

2.6 DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING IN ORTHODONTICS

- Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- Problem cases – analysis of cases and its management
- Adult cases, handicapped and mentally retarded cases and their special problems
- Critique of treated cases.

Cephalometrics

- Instrumentation
- Image processing
- Tracing and analysis of errors and applications
- Radiation hygiene
- Advanced Cephalometrics techniques
- Comprehensive review of literature
- Video imaging principles and application.

Craniofacial Imaging - Advances

- Digital imaging
- Volumetric Imaging
- Computed Tomography
- Cone Beam Computed Tomography
- Laser Scanning
- Stereo photogrammetry
- Three dimensional facial Imaging
- Computed Tomography of TMJ
- Arthrography
- Magnetic Resonance Imaging

2.7 PRACTICE MANAGEMENT IN ORTHODONTICS:

- Economics and dynamics of solo and group practices
- Personal management
- Materials management
- Public relations
- Professional relationship
- Dental ethics and jurisprudence
- Office sterilization procedures
- Community based Orthodontics.

Paper III: Clinical Orthodontics

3.1 Myofunctional Orthodontics:

- Basic principles
- Contemporary appliances – their design and manipulation
- Case selection and evaluation of the treatment results
- Review of the current literature.

3.2 Dentofacial Orthopedics

- Principles
- Biomechanics
- Appliance design and manipulation –various appliances
- Review of contemporary literature

3.3 Cleft lip and palate rehabilitation:

- Diagnosis and treatment planning

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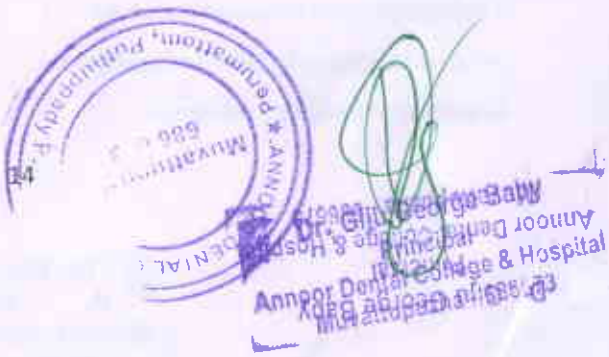

- Mechanotherapy
- Special growth problems of cleft cases
- Speech physiology, pathology and elements of therapy as applied to orthodontics
- Team rehabilitative procedures.

3.4 Biology of tooth movement:

- Principles of tooth movement-review
- Review of contemporary literature
- Applied histophysiology of bone, periodontal ligament
- Molecular and ultra cellular consideration in tooth movement
    - Accelerated Orthodontics

3.5 Orthodontic / Orthognathic surgery:

- Orthodontist' role in conjoint diagnosis and treatment planning
- Pre and post-surgical Orthodontics
- Participation in actual clinical cases, progress evaluation and post retention study
- Review of current literature

3.6 Ortho / Perio / Prostho inter relationship

- Principles of interdisciplinary patient treatment
- Common problems and their management

3.7 Basic principles of Mechanotherapy Includes **Removable** appliances and all types of **FIXED APPLIANCES (Edgewiswe, Begg, Preadjusted Edgewise, Tip Edge, Lingual etc.,)**

- Design
- Construction
- Fabrication – arch wire fabrications/loop configurations/ Bracket positions/segmented/sectional
- Management
- Review of current literature on treatment methods and results

3.8 Applied preventive aspects in Orthodontics

- Caries and periodontal disease prevention
- Oral hygiene measures
- Clinical procedures

3.9 Interceptive Orthodontics

- Principles
- Growth guidance
- Diagnosis and treatment planning
- Therapy emphasis on:

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a. Dento-facial problems

b. Tooth material discrepancies

c. Minor surgery for Orthodontics

3.10 Retention and relapse

- Mechanotherapy – special reference to stability of results with various procedures
- Post retention analysis
- Review of contemporary literature

3.11 RECENT ADVANCES:

- Temporary Anchorage Devices
- Lasers
- Application of F.E.M.
- Distraction Osteogenesis
- Advances in Craniofacial Imaging
- Obstructive Sleep Apnoea-Orthodontic perspective
- Lingual Orthodontics
- Clear Aligners
- Self Ligating bracket system
- Periodontally Accelerated Osteogenic Orthodontics
- Orthodontic treatment impact on OHRQoL (Oral Health Related Quality ofLife)

Paper IV :Essay

4. **The teaching program** should be structured one with following aspects clearly spelt out.
   - Objectives and the expected learning outcome from each block of 6-8 months duration
   - Methods of teaching, individual topics namely didactic lectures, seminars, journal club, tutorials, discussion, etc.
   - Assessing method and the frequency of assessment.
   - Remedial measures
5. **Clinical training** in the following aspects.
   - Removable active appliances- 5cases
   - Class-Imalocclusion with Crowding
   - Class-Imalocclusion with bi-maxillary protrusion
   - Class-IIdivision-1
   - Class-IIdivision-2

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Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Oral Pathology and Microbiology

Course Code: 246

(2016-17 Academic year onwards)

2016

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Muvattupuzha
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ii. No student shall be permitted to complete the course by attending more than 6 continuous years.

iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

The concept of health care counseling shall be incorporated in all relevant areas.

PAPER 1 : Applied Anatomy, Physiology, Pathology and Research Methodology

1. Applied General Anatomy

1.1.Osteology of head and neck
1.2.Muscles of mastication
  1.2.1. blood supply & drainage
  1.2.2.innervation
1.3.Muscles of facial expression
  1.3.1. blood supply & drainage
  1.3.2. innervations
1.4. Cranial nerves- 5, 7 , 9, 11.
1.5.Paranasal air sinuses
1.6.Palate
1.7.Submandibular gland
1.8.Sub lingual gland
1.9.Parotid gland
1.10.Anatomy of tongue –
  1.10.1.Muscles
  1.10.2.Blood and nerve supply.
1.11.TMJ
  1.11.1.structure
  1.11.2.movements of TMJ
  1.11.3.relations
  1.11.4.ankylosis
  1.11.5.age changes.

2. Embryology

2.1.Development of face
2.2.Development of paranasal air sinuses
2.3.Pharyngeal apparatus
2.4.Development of tooth in detail and the age changes
2.5.Development of salivary glands

2.6.Development of palate
2.7.Development of tongue
2.8.Congenital anomalies of face

3. Genetics applied to dentistry.
3.1.Modes of Inheritance
3.2.Chromosomal and genetic anomalies

4.Physiology

4.1.Blood and Lymph
4.1.1.Composition & functions of blood,
4.1.2.Plasma, plasma functions, Plasma proteins - Types, concentration, functions & variations, Erythrocyte: Morphology, functions and variations.
4.1.3.Erythropoiesis and factors affecting erythropoiesis
4.1.4.ESR- factors affecting, variations and significance.
4.1.5.Haemoglobin - Normal concentration, method of determination and variation in concentration, functions
4.1.6.Anaemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice -types.
4.1.6.Hemolysis and Fragility of RBC
4.1.7.Leukocytes: Classification, number, percentage, distribution morphology, properties, Functions & variation. Role of lymphocytes in immunity, life span & fate of Leukocytes.
4.1.8.Thromobocytes - Morphology, number, variations, function.
4.1.9.Haemostasis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
4.1.10.Fibrinolytic system.
4.1.11.Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action.
4.1.12.Hemorrhage
4.1.13.Bleeding disorders.
4.1.14.Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.
4.1.15.Blood volume: Normal values, variations.
4.1.16.Functions of reticulo-endothelial system.
4.1.17.Specific gravity, Packed cell volume, Methods of estimation
4.1.18.Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.
4.1.19.Leucopoiesis
4.1.20.Thrombopoiesis
4.1.21.Hydrogen ion concentration of blood.
4.1.22.Homeostasis, Fluid and Electrolyte Balance, Acid Base Balance.
4.1.23.Osmotic and Oncotic pressure.
4.1.24.Lymph – Composition and Functions – Comparison with Blood

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4.2.Gastro - Intestinal Tract:

4.2.1. composition, functions and regulation of:
4.2.2. Saliva
4.2.3. Gastric juice
4.2.4. Pancreatic juice
4.2.5. Bile
4.2.6 Intestinal juice
4.2.7. Mastication
4.2.8.Deglutition

4.3.ENDOCRINE SYSTEM:

4.3.1.Growth hormone
4.3.2.Thyroid hormones
4.3.3.Parathyroid hormones
4.3.4.Calcium homeostasis

5.BIOCHEMISTRY

5.1.Nucleic acids

5.1.1.DNA/RNA-outline of structure
5.1.2.Transcription/translation steps of protein synthesis, inhibitors of protein synthesis, regulation of gene function

5.2.Energy Metabolism

5.2.1.Basal metabolic rate
5.2.2. Vitamins -specifically vitamin A, vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

6. General Histology

6.1.Different types of epithelium
6.2.Bone
6.3.Cellular elements of blood
6.4.Lymphatic system
6.5.Muscle
6.6.Neural tissue

7.Oral and Dental Anatomy

7.1.Morphology of individual teeth in primary dentition with variations.
7.2.Morphology of individual teeth in permanent dentition.
7.3.Anatomy of pulp canal and their variations.
7.4.Occlusion
7.5.Dental arch formation
7.6.Development of occlusion from gum pads
7.7.Deciduous, mixed and permanent dentition.
7.8.Sequence of eruption.
7.9.Age changes in the dentition.
7.10.Oral and dental developmental anomalies.
7.11.Amelogenesis imperfecta.
7.12.Dentinogenesis imperfecta.
7.13.Tooth numbering systems

8. Oral Histology

8.1.Structure of the oral tissues.
8.2.Cytoskeleton
8.3.Cell junctions
8.4.Hard tissue formation and destruction.
8.5.Development of the tooth and its supporting tissues.
8.6.Bone
8.7.Dentinogenesis
8.8.Dentin
8.9.Pulp
8.10.Amelogenesis
8.11.Enamel structure
8.12.Cementum
8.13.Periodontium
8.14.Physiologic tooth movement
8.15.Eruption and shedding
8.16.Salivary glands
8.17.Oral mucosa
8.18.Temporomandibular joint
8.19.Repair and regeneration of dental tissue
8.20.Prenatal facial growth and development
8.21.Postnatal facial growth and development.

9.General Pathology

9.1.Introduction – pathology of the cell
9.2Cellular adaptation, cellular degeneration
9.3.Apoptosis and necrosis
9.4.Gangrene
9.5.Pathologic calcification
9.6.Intracellular accumulations – fatty changes, deposition of proteins, glycogen
9.7.Acute inflammation
9.8.Vascular events of inflammation
9.9.Cellular events of inflammation
9.10.Chronic inflammation
9.11.Mediators of inflammation
9.12.Exudate and transudate
9.13.Healing, regeneration, repair mechanisms
9.14.Wound healing.
9.15.Healing by primary intention
9.16.Healing by secondary intention
9.17.Fracture healing
9.18.Factors influencing healing process, complications
9.19.Immunological mechanisms in disease
9.20.Humoral & cellular immunity
9.21.Hypersensitivity and allergy

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9.22.Autoimmunity.
9.23.Normal water and electrolyte balance
9.24.Derangements of body fluids
9.25.Bleeding disorders
9.26.Hemorrhage and shock
9.27.Metabolic disorders – kwashiorkar, maramus
9.28.Hypervitaminosis, hypovitaminosis,
9.29.Rickets, osteomalacia.
9.30.Physical and chemical injuries.
9.31.Atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia
9.32.Premalignant lesions.

10. Microbiology

10.1.Culture media.
10.2.Infection control
10.3.Sterilization and asepsis with special reference to dental office
10.4.Hand washing and hand hygiene.
10.5.Personal protective equipments.
10.6.Handling of sharp instruments.
10.7.Needle-stick injury, exposure to body fluids.
10.8.Post-exposure prophylaxis.
10.9.Management and disposal of waste.
10.10.Communicable diseases and notification.
10.11.Infection and resistance-defense mechanisms
10.12.Experimental animals & hospital infections.

11. Basic Immunology

11.1.Cellular and humoral Immunity
11.2.Antigen and Antibody System
11.3. Hypersensitivity
11.4. Autoimmune diseases.

12. Biostatistics

12.1.Introduction, definition and branches of biostatistics
12.2.Collection of data
12.3.Sampling- types
12.4.Bias and errors
12.5.Compiling data-graphs and charts
12.6.Measures of central tendency (mean, median and mode)
12.7.Standard deviation
12.8.Tests of significance (chi square test't'test and z-test)
12.9.Null hypothesis

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13.Ethics in Dentistry.

13.1.Introduction to ethics:

13.1.1. What is ethics?

13.1.2 .What are values and norms?

13.1.3 .How to form a value system in one's personal and professional life?

13.1.4 .Hippocratic oath.

13.2. Ethics of the Individual

13.2.1. The patient as a person

13.2.2. Right to be respected

13.2.3. Truth and confidentiality

13.2.4 .Autonomy of decision

13.2.5 .Doctor patient relationship

13.3. Professional Ethics

13.3.1. Code of conduct

13.3.2.Contract and confidentiality

PAPER II: Oral pathology, Microbiology and Oncology

1. 1Developmental defects of the oral and maxillofacial region. 1.2.Abnormalities of the teeth

1.3. Pulpal and periapical diseases

1.4.Bacterial infections

1.5.Fungal and protozoal diseases

1.6.Viral diseases

1.7.Physical & chemical injuries

1.8.Allergies and immunological diseases

1.9.Epithelial pathology

1.10. Salivary gland pathology

1.11. Soft tissue tumours

1.12. Heamatologic disorders

1.13. Bone pathology

1.14. Odontogenic cyst and tumours

1.15. Dermatologic diseases

1.16. Oral manifestations of systemic disease

1.17. Facial pain and neuromuscular disease

1.18. Forensic odontology

1.19. Differential diagnosis of oral and maxillofacial lesions

1.20. Oral biopsies

1.21. Oral cytology

1.22. Dental caries

1.23. Oral bacterial flora

1.24. Basic immunology and virology

1.25. Lymph node and reticulo endothelial pathology

1.26. Dermatopathology

1.27. Radiation pathology

1.28. Regressive alterations of the teeth

1.29. Spread of oral infection

1.30. Healing of oral wounds

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1.31. Oral aspects of metabolic disease
1.32. Disease of nerve and muscle
1.33. Diagnostic lab procedure

2. ORAL MICROBIOLOGY AND IMMUNOLOGY

2.1. Normal oral microbial flora
2.2. Defense mechanism of the oral cavity.
2.3. Microbiology and immunology of Dental Caries and Periodontal diseases
2.4. Dental Caries – Introduction, Epidemiology, Microbiology, cariogenic bacteria including properties, acid production in plaque, development of lesion, response of dentin-pulp unit, histopathology, Root caries, Sequelae and Immunology.
2.5. Tumor Immunology
2.6. Infections of the pulp and periodontal tissues
2.7. Oral Sepsis and Bacteremia
2.8. Microbial Genetics

3. FORENSIC ODONTOLOGY

3.1. Legal procedures like inquest, medico legal evidences, post mortem examination of violence around the head and neck region, identification of deceased individual using teeth and other oral tissues.
3.2. Bite marks, Rugae patterns and lip prints.
3.3. Saliva and its use in forensic identification.
3.4. The molecular biology of cancer
3.5. Carcinogenesis
3.6. Recent advances in oral oncology
3.7. Aetiology, epidemiology and prevention of cancer

PAPER III : Laboratory techniques and Diagnosis and Oncology

1. Principles and practice of microscopy and photo microscopy
2. Types of biopsies – principles and methods
3. Principles and techniques in routine laboratory procedures in the identification of various oral disease
4. Investigations and Lab Procedures in Forensic odontology
5. Fixation and fixatives
6. Tissue processing, microtomy and paraffin sections
7. Frozen and related sections
8. The theory of staining
9. The haematoxylin and eosin
10. Connective tissues and stains
11. Proteins and nucleic acids
12. Amyloid
13. Carbohydrates
14. Lipids
15. Pigments and minerals
16. Micro-organisms
17. Bone
18. Cytoplasmic granules, organelles and special tissues
19. Enzyme histochemistry and Immunohistochemistry
20. In-situ hybridization
21. Diagnostic cytopathology

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22. Resin embedding media
23. Electron microscopy
24. Quantification in histopathology
25. Safety in histopathology lab
26. Audit in histopathology

PAPER IV – GENERAL ESSAY
Three hour Essay pertaining to any of the speciality topics.

2.7 Total number of hours

As per the instruction given by the DCI

2.8 Branches if any with definition

Oral Pathology and Microbiology

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the

candidate / PG at the end of the session.

- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. 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 through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or

a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause2.6

2.11 No: of hours per subject

As per the DCI guidelines

2.12 Practical training

Present in clause2.6

2.13 Records

Present in clause2.20

2.14 Dissertation: As per Dissertations Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

i. Introduction
ii. Aims and Objectives of the study
iii. Review of Literature
iv. Methodology
v. Results
vi. Discussion
vii. Conclusion

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viii. Summary
ix. References
x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd Academic year, whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners /assessors, of which two shall be from outside the state and one from the affiliated colleges o KUHS. If modifications are to be made as specified, three hard copies and one soft copy of the dissertation after corrections made by the candidiate should be submitted with in a minimum of 30 days to the University. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the University examination. Hall tickets for the university examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted

REGULATIONS 2016

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596

Master of Dental Surgery (MDS)

Pedodontics and Preventive Dentistry

Course Code:247

(2016-17 Academic year onwards)

2016

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Syllabus

The syllabus for the theory of the specialty of Pedodontics should cover the entire field of the subject and the following topics may be used as guidelines.

The concept of health care counseling shall be incorporated in all relevant areas.

1. **Growth and Development:** Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures. Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth. Eruption and Exfoliation of teeth.
2. **Child Psychology:** Development and classification of behaviour, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear anxiety, apprehension and its management.
3. **Behaviour Management:** Non-pharmacological and Pharmacological methods.
   Conscious Sedation, Deep Sedation and General Anaesthesia in Pediatric Dentistry. Including other drugs, Synergistic and Antagonistic actions of various drugs used in children.
4. Child Abuse and Neglect.
5. **Preventive Pedodontics**: Concepts, chairside preventive measures for dental diseases, high-risk caries including rampant and extensive caries – Recognition, features and Preventive Management, Pit and Fissure Sealants, Oral Hygiene measures, correlation of brushing with dental caries and periodontal diseases. Diet and Nutrition as related to dental caries. Diet Counseling.
6. **Dental Plaque: Definition, Initiation, Pathogenesis, Biochemistry, Morphology and Metabolism.**

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7. **Microbiology and Immunology as related to oral diseases in children:** Basic concepts, Immune system in human body, Autoimmune diseases, Histopathology, Pathogenesis, Immunology of Dental caries, Periodontal diseases, Tumours, Oral mucosal lesions, etc.

8. **Gingival and Periodontal Diseases in children:**

   8.1. Normal Gingiva and Periodontium in children.

   8.2. Gingival and Periodontal Diseases – Etiology, Pathogenesis, Prevention and Management.

9. **Pediatric Conservative Dentistry:**

   9.1. Principles of Pediatric Operative Dentistry along with modifications of materials – past, current and advances including tooth coloured materials.

   9.2. Modifications required for cavity preparation in primary and young permanent teeth.

   9.3. Various isolation techniques.

   9.4. Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites, Compomers, Silver amalgam and latest restorative materials.

   9.5. Basic and advanced knowledge about dentin bonding system and bonded restorations.

   9.6. Stainless steel, polycarbonate and Resin crowns/veneers and full metal crowns.

10. **Pediatric Endodontics:**

   10.1. Primary dentition – Diagnosis of Pulpal Diseases and their management – Pulp capping, Pulpotomy, Pulpectomy, Controversies and recent concepts.

   10.2. Young Permanent Teeth and Permanent Teeth – Pulp Capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.

   10.3. Recent advances in Pediatric Endodontics.

11. Prosthodontic considerations in Pediatric Dentistry.

12. **Traumatic Injuries in Children:**

   12.1. [redacted].

   12.2. Sequelae and reaction of teeth to trauma.

   12.3. Management of Traumatised teeth with latest concepts.

13. **Preventive and Interceptive Orthodontics:**

   13.1. Concepts of occlusion and esthetics: Structure and Function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory functions, diagnosis of occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.

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13.2. A comprehensive review of the local and systemic factors in the causation of malocclusion.

13.3. Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).

13.4. Space Management – Etiology, Diagnosis of space problems, Analysis, Biomechanics, Space Maintenance and maintainers, Serial Extraction.

13.5. Biology of Tooth Movement, Physiologic Tooth resorption and exfoliation, Eruption – A comprehensive review of the principles of teeth movements, exfoliation, eruption of teeth. Review of contemporary literature. Histopathology of bone and periodontal ligament, molecular and ultra cellular consideration in tooth movement, physiologic tooth resorption and eruption.

13.6. Myofunctional appliances – Basic principles, Contemporary appliances; Design and Fabrication.

13.7. Removable Appliances - Basic principles, Contemporary appliances; Design and Fabrication.

13.8. Case selection and diagnosis in interceptive orthodontics – Cephalometrics, Image processing, Tracing, Radiation hygiene, Video Imaging and advanced cephalometric techniques.

14. Oral Habits in Children:

14.1. Definition, etiology and classification.

14.2. Diagnosis, clinical features and dentoalveolar effects of Digit Sucking, Tongue Thrusting, Mouth Breathing and various other oral habits.

14.3. Management of oral habits in children.

15. Dental Care of Children with Special Needs: Definition, Behavioural, Clinical Features and Management of Children with

15.1. Physically Handicapping Conditions.

15.2. Mentally Compromising Conditions.

15.3. Medically Compromising Conditions.

15.4. Genetic Disorders.

16. Oral Manifestations of Systemic Conditions in Children and their management.

17. Cross infection control in dental clinic/laboratory.

18. Methods of sterilization and asepsis in clinics.

19. Management of Minor Oral Surgical Procedures in Children.

20. Dental Radiology as related to Pediatric Dentistry.

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21. [redacted]

21.1. Historical Background

21.2. Definition, Etiology and Pathogenesis.

21.3. Caries pattern in Primary, Young Permanent and Permanent teeth in Children.

21.4. Rampant Caries, Early Childhood Caries and Extensive Caries – Definition, etiology, pathogenesis, Clinical features, Complications and Management.

21.5. Role of Diet and Nutrition in Dental Caries.

21.6. Cariogenecity of various foods.

21.7. Dietary modifications and Diet Counseling.

21.8. Caries Activity Tests, Caries Prediction, Caries Susceptibility Tests and their clinical applications.

22. **Pediatric Oral Medicine and Clinical Pathology:** Recognition and Management of Developmental Dental Anomalies, Teething Disorders, Stomatological conditions, Mucosal Lesions, Oral Infections, etc.

23. **Congenital Abnormalities in Children:** Definition, Classification, Clinical features and management.

24. Dental Emergencies in Children and their Management.

25. Dental Materials used in Pediatric Dentistry.

26. **Preventive Dentistry:**

26.1. Definition

26.2. Levels of Prevention.

26.3. Different preventive measures used in Pediatric Dentistry including Pit and Fissure Sealants and Caries Vaccine.

26.4. Role of fluorides

26.5. Diet Counseling.

27. **Dental Health Education and School Dental Health Programmes:** Dental Health Concepts, Effects of Civilization and Environment, Dental Health Delivery System, Dental Health Surveys, Public Health measures related to children along with principles of children's Preventive Dentistry.

28. School Dental Health programmes – Incremental and Comprehensive Care.

29. National Oral health Policy.

30. Epidemiology of oral Diseases – Dental Caries, Gingival and periodontal diseases, malocclusion, dental fluorosis.

31. Oral Survey Procedures

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31.1. Planning

31.2. Implementation

31.3. WHO Basic Oral health methods.

31.4. Indices for oral diseases.

32. Fluorides:

32.1. Historical background.

32.2. Systemic and Topical Fluorides.

32.3. Mechanism of Action.

32.4. Toxicity and Management.

32.5. Defluoridation techniques.

33. Medicolegal aspects in pediatric Dentistry with emphasis on informed consent.

34. Case History Recording: Outline of Principles of Examination, Diagnosis and Treatment Planning.

35. Epidemiology:

35.1. Concepts

35.2. Methods of Recording and Evaluation of various oral diseases.

35.3. Various National and Global trends of epidemiology of oral diseases.

36. Comprehensive Infant Oral Health Care.

37. Comprehensive cleft lip and palate care management with emphasis on counseling, feeding remodeling, speech rehabilitation.

38. Principles of Biostatistics, Research Methodology, Understanding of Computers and Photography.

39. Setting up of Pedodontic and Preventive Dentistry Clinic.

40. Emerging concepts in Pediatric Dentistry on scope of LASERS

41. Minimal Invasive Dentistry

42. Nanodentistry in Pediatric Dentistry.

43. Evidence Based Dentistry.

44. Genetics and Molecular Biology

45. Biomimetics and Smart Materials.

46. Tooth Banking

47. Implantology – Basic Principles.

48. Hospital based dentistry.

49. Changing Trends in Oral Diseases in Children.

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