# THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

**No. 69, ANNA SALAI, GUINDY, CHENNAI – 600 032.**

# B.D.S.

## DEGREE COURSES

# SYLLABUS AND CURRICULUM

# THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY, CHENNAI

## PREFACE

The Syllabus and Curriculum for the B.D.S.Courses have been restructured with the Experts from the concerned specialities to educate students of BDS courseto

1. Take up the responsibilities of dental surgeon of first contact and be capable of functioning independently in both urban and rural environment.
2. Provide educational experience that allows hands-on-experience both in hospital as well as in community setting.
3. Make maximum efforts to encourage integrated teaching and de-emphasize compartmentalisation of disciplines so as to achieve horizontal and vertical integration in different phases.
4. Offer educational experience that emphasizes health rather than only disease.
5. Teach common problems of health and disease and to the national programmes.
6. Use learner oriented methods, which would encourage clarity of expression, independence of judgement, scientific habits, problem solving abilities, self initiated and self-directed learning.
7. Use of active methods of learning such as group discussions, seminars, role play, field visits, demonstrations, peer interactions etc., which would enable students to develop personality, communication skills and other qualities towards patient care.

The Students passing out of this Prestigious University should be acquire adequate knowledge, necessary skills and such attitudes which are required for carrying out all the activities appropriate to general dental practice involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The students should also understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

(Subject to changes in Amendments in DCI Regulations and SAB Resolutions)

**Prof. Dr.S.GEETHALAKSHMI, M.D., Ph.D.**
**VICE-CHANCELLOR**

**Comments / Feed back are welcome if any and mail it to registrar@tnmgrmu.ac.in**

# B.D.S. - DEGREE COURSE

## SECOND YEAR SUBJECTS

# 4. GENERAL PATHOLOGY

1. **GOAL**

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.

2. **OBJECTIVES**

a. KNOWLEDGE AND UNDERSTANDING:

- To demonstrate and analyze pathological changes at macroscopic and microscopic levels and explain their observations in terms of disease processes.
- To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
- To demonstrate understanding of the capabilities and limitations of morphological pathology in its contribution to medicine, dentistry and biological research.
- To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

b. SKILLS:

- A dental graduate should be able to identify the abnormal diseases like tumor, non tumours and also to arrive what are the investigations needed for the diagnosis of the diseases.
- Carry out certain investigations and ability to interpret lab findings.

c. ATTITUDE:

- A dental student must be willing to apply the knowledge gained in pathology in the best interest of the patient and the community.
- Maintain a high standard of professional ethics In patient care and also in carrying out the diagnostic modalities.
- Willing to update knowledge in pathological conditions and diagnostic investigations from time to time.

d. INTEGRATION

The dental student must be able to integrate the pathological aspects with the diseases so that it helps to understand the disease nature and management of the disease.

e. COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

f. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to subject

4. **TEACHING HOURS**

Lecture hours - **55**
Practical hours - **55**
Total hours **110 hours**

5. **TEACHING METHODOLOGY**

Lectures, symposiums, vertical and horizontal integrated teachings, viva voce, CMEs etc.The objectives of teaching General Pathology can be achieved by various teaching techniques such as :

a) Lectures
b) Lecture Demonstrations
c) Practical exercises
d) Audio visual aids
e) Small group discussions with regular feedback from the students
f) Integrated Teaching
g) Symposium and continuing medical education programmes

6. **THEORY SYLLABUS**

| TOPIC | MUST KNOW | DESIRABLE TO KNOW | NICE TO KNOW |
|---|---|---|---|
| Introduction | Cellular responses to stress & noxious stimuli, cellular adaptation of growth & differentiation (hyperplasia, hypertrophy, atrophy & metaplasia)<br><br>Cell injury and cell death<br>(cause & mechanism of reversible & irreversible injury)<br><br>Morphology of cell injury (reversible & necrosis), examples of cell injury and necrosis (ischemic, hypoxic, reperfusion and chemical injuries) | Historical aspects; definition of terms; introduction to pathology, its applications and role in patient management. | |

| | | | |
|---|---|---|---|
| | Apoptosis and sub-cellular responses to injury<br><br>Intracellular accumulation, calcification & cellular aging; (Lipid, protein, glycogen and pigment accumulation; pathologic calcification; ageing) | | |
| Inflammation/ Repair | Introduction to body's immune response (innate & adaptive immunity; cells and tissues of immune system; cytokines; structure & function of HLA)<br><br>General features of inflammation; history; stimuli for acute inflammation; vascular events; cellular events - leucocyte adhesion and transmigration<br><br>Continuation of cellular events (chemotaxis, phagocytosis, defects of leucocyte function); termination of acute inflammatory response; outcome of acute inflammation; morphological patterns of acute inflammation;<br><br>Chemical mediators (vasoactive amines; plasma proteins; AA metabolites; PAF; cytokines; chemokines; leucotrienes; NO; free radicals & neuropeptides)<br><br>Chronic inflammation (cause, morphological features; cells of chronic inflammation; granuloma; systemic effects of inflammation; consequences of excessive/defective inflammation)<br><br>Repair (healing; scar formation; cutaneous wound healing);<br><br>Repair (continued) (healing at special sites; factors | | |

| | | | |
|---|---|---|---|
| | affecting wound healing) | | |
| Haemodynamic disturbances | Oedema, Hypotension, congestion, haemorrhage & haemostasis<br><br>Thrombosis & embolism Infarction, Shock | | |
| Disorders of Immunity | Disorders of immunity – mechanisms of hypersensitivity, Graft Rejection<br><br>Autoimmunity – SLE<br><br>Primary & secondary immunodeficiency<br><br>Amyloidosis | Rheumatoid arthritis, systemic sclerosis, Sjogren's, MCD, | |
| Neoplasia | Definition, nomenclature, biology of tumour growth, differences between benign & malignant tumours<br><br>Tumour spread & epidemiology<br><br>Molecular basis of Neoplasia (essential alterations for malignant transformation, oncogenes, suppressor genes)<br><br>Evasion of apoptosis; defects in DNA repair, telomerase and angiogenesis; invasion & metastasis; dysregulation of genes)<br><br>Carcinogenesis (carcinogenic agents, molecular basis of carcinogenesis)<br><br>Host defense, tumour immunity, clinical features, and laboratory diagnosis. | | |
| Infectious | Mycobacterial infections – tuberculosis HIV & Hepatitis | Typhoid, syphilis | General principles |

| | | | |
|---|---|---|---|
| diseases | Viruses | and others<br><br>Fungal & parasitic infections | (categories, transmission & dissemination of microbes, mechanisms of microbial disease, immune evasion, infections in immunosuppressed hosts, tissue response to microbes)<br><br>Pathology of common viral & bacterial infections (CMV, EBV, HPV, viruses, gram positive & negative bacterial infections) |
| Nutritional | | Nutritional diseases | |
| RBC & bleeding disorders | Development of haematopoietic cells, bone marrow, classification of anaemia<br><br>Iron deficiency anaemia, Megaloblastic anaemia<br><br>Bleeding disorders – classification, disorders of platelets Coagulation disorders | | |
| WBC, lymph node, spleen | Leukaemia – classification, aetiology, acute leukaemias.<br><br>Chronic leukaemias, MDS, other chronic myelo- | Non-neoplastic quantitative and qualitative disorders of | |

| | | | |
|---|---|---|---|
| | proliferative disorders including myelofibrosis<br><br>Hodgkin Lymphoma<br><br>Blood banking | leucocytes<br><br>Non-neoplastic disorders of lymph node, spleen & thymus; classification of lymphoma | |
| Systemic Pathology | Atherosclerosis<br><br>Hypertension, vasculitis | Congenital anomalies, aneurysms, tumors. | |
| The Heart | Ischemic heart disease & myocardial infarction<br><br>Rheumatic fever; Infective endocarditic | Congenital heart disease, diseases of the myocardium, tumors of the heart; diseases of the pericardium | |
| Head and neck | Benign and malignant lesions of head and neck including oral cavity, salivary glands | | |
| Kidney | Nephrotic syndrome – pathogenesis and pathology | Normal structure, congenital anomalies, cystic disease, laboratory tests in renal disease. | |
| Endocrine system | Diabetes mellitus | | |
| Bone & Joints | Infections, metabolic disease of bone<br><br>Bone tumours/Jaw tumours | | |

**Bioethics**

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; Environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment and public health ethics.

7. **PRACTICALS**:

**PROCEDURES:**

1. Urine – Tests for Abnormal constituents Sugar, albumin, ketone bodies, Blood, bile salts, bile pigments.
2. Haemoglobin (Hb) estimation as OSPE
3. Total WBC count from the peripheral smear
4. Differential WBC Count and commenting on the peripheral smear
5. Blood grouping as OSPE

**DEMONSTRATIONS**

6. Packed cell volume(PCV,) Erythrocyte Sedimentation Rate (ESR)
7. Bleeding Time & Clotting Time
8. Histopathology Tissue Processing Staining
9. Histopathology slides

   Acute appendicitis
   Granulation tissue
   fatty liver
   CVC lung
   CVC liver
   CVC Spleen
   Lipoma
   Teratoma
   Tuberculosis of Lymph node
   Maduramycosis
   Actionomycosis

Rhinosporidiosis
Basal cell Carcinoma
Squamous cell Carcinoma
Malignant melanoma,
Ameloblastoma,
Squamous papllioma
Hodgkins Lymphoma
Pleomorphc adenoma
Cavernous hemangioma
Capillary hemangioma
Osteosarcoma
osteoclastoma

## HEMATOLOGY SLIDES

Iron deficiency anemia
Acute Myeloid Leukemia
Chronic Myeloid Leukemia
Eosinophila

## LIST OF SPECIMENS:

i. cute appendicitis
ii. Fatty liver
iii. CVC lung
iv. CVC Liver
v. Infarct spleen
vi. TB lymph Node
vii. Lipoma
viii. Myxoma
ix. Chondroma
x. Squamous cell carcinoma
xi. Pleomorphic adenoma

xii. Teratoma
xiii. Malignant Melanoma

**Instruments**:

i. RBC Pipette
ii. WBC Pipette
iii. ESR Westergrens tube
iv. SAHLI'S hemoglobinometer
v. PCV tube
vi. Bone marrow biopsy needle
vii. Bone marrow aspiration needle

8. **THEORY EXAMINATION (TITLE AND QP PATTERN WITH MARKS)**

Part A - Pathology:
Essay 1X10 = 10 Marks
Short notes 3X 5 = 15 Marks
Short Answers 5X2 = 10 Marks

Total = 35 Marks

**9. PRACTICAL EXAMINATIONS- experiments, slides and OSPE**
Lab experiments 45 marks
Major experiment – Hematology -
Peripheral smear/ DC - 15 Marks, 45 Minutes
Urine analysis - 10 Marks, 30 Minutes
Minor experiment(OSPE) - 10 Marks, 20 Minutes (for Hb%)
Spotters - 10 Marks, 20 minutes

Total 45 marks

Viva - 10 marks

**SPOTTERS**:

i. Histo pathology slides
ii. Haematology slides
iii. Gross specimens
iv. Instruments

Scheme for practical examinations
Procedure
Demonstrations
Viva

| | Examination | Internal Assessment | Viva | Total |
|---|---|---|---|---|
| Theory | 35 | 5 | 10 | 50 |
| Practicals | 45 | 5 | - | 50 |
| Total | | | | 100 |

**10. FORMATIVE/INTERNAL ASSESSMENT**

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the University, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Topics:

i. Cell injury and adaptations,Inflammation wound healing
ii. Hemodynamic changesNeoplasia
iii. Infectious diseasesNutritional disorders

iv. Disorders of circulations, Immunity, Diseases of oral cavity
v. Diseases of the salivary glands, Bones, cardiovascular system
vi. Hematology(RBC, WBC AND PLATELETS, LYMPHNODE, SPLEEN AND THYMUS)

Theory - 5 Marks
Practical - 5 Marks
Total - 10 marks

**11. RECORD NOTE / LOG BOOK**:

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

**12. TEXT BOOKS**

i. Robbins BASIC PATHOLOGY – by Kumar, Abbas and Aster- 1st South Asia edition
ii. Text book of Pathology By Harsh Mohan 7th Edition
iii. Andersons pathology Volume 1 And 2 by Ivan Damjanov & James Linder
iv. 3.Wintrobe's Clinical Hematology by Lee, Bithell,Forster.

**13. REFERENCE BOOKS**:

i. Robbins – Pathologic Basis of Diseases By Kumar and Kotran 10th Edition.
ii. Ackermann Surgical Pathology
iii. Microbiology – Prescott, et al.
iv. Microbiology – Bernard D. Davis, et al.
v. Clinical & Pathogenic Microbiology – Barbara J Howard, er al.
vi. Mechanisms of Microbial diseases – Moselio Schechter, et al.
vii. Immunology an Introduction – Tizard
viii. Immunology 3rd edition – Evan Roitt, et al.

# MICROBIOLOGY

## 1. GOAL

To introduce the students to the exciting world of microbes and to provide an understanding of various branches of Microbiology, in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment, control and prevention of infections in dental practice.

## 2. OBJECTIVES

a. KNOWLEDGE AND UNDERSTANDING:

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

i. Understand the basics of various branches of Microbiology and able to apply the knowledge relevantly.
ii. Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral Medicine in higher classes.
iii. Understand and practice various methods of Sterilisation and disinfection in dental clinics.
iv. Have a sound understanding of various infectious diseases and lesions in the oral cavity.
v. Awareness of Health care associated infections and their prevention in dental practice

b. SKILLS

i. Student should have acquired the skill to diagnose, differentiate various oral lesions.
ii. Should be able to select, collect and transport clinical specimens to the laboratory.
iii. Should be able to carry out proper aseptic procedures in the dental clinic.
iv. Interpretation of antimicrobial susceptibility tests and to make right choice of antibiotic based on spectrum of infection and ensure appropriate use to avoid antibiotic resistance.

c. ATTITUDE:

i. To apply knowledge in the interest of the individual patient and community.
ii. Maintain high standards of professional ethics in patient care and in carrying out diagnostic tests.

iii. To update knowledge from time to time with regard to diagnostics and immunoprophylaxis.

d. INTEGRATION:

At the end of integrated teaching the student shall acquire integrated knowledge from different disciplines which includes etiology,morphology,pathogenesis, clinical features,laboratory diagnosis,treatment,prevention and control of infectious diseases.

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilisation : of instruments , clinical area/ personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY:

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
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d) Antivirus software which is current and consistently updated
e) Microsoft Office
f) Adobe Reader (or equivalent to view PDF files)

**3. COMPETENCIES**

1. General skills
2. Practice Management

3. Communication to Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies specific to the subject

## 4. TEACHING HOURS

- Lecture hours 65
- Practical hours 50

Total hours 115

## 5. TEACHING METHODOLOGY

The objectives of teaching microbiology can be achieved by various teaching techniques such as :
a) Lectures
b) Lecture Demonstrations
c) Practical exercises
d) Audio visual aids
e) Small group discussions with regular feed back from the students
f) Integrated Teaching
g) Symposium and continuing medical education programmes.

## 6. THEORY SYLLABUS

| TOPIC | MUST KNOW | DESIRABLE TO KNOW | NICE TO KNOW |
|---|---|---|---|
| Introduction, History | Noble laureates and their contributions to medical microbiology, Detailed contributions of Louis Pasteur, and Robert Koch | | |
| | Morphology physiology, classification of bacteria, different methods of staining | | |
| | Sterilization and disinfection including sterilization controls | | |

| | | | |
|---|---|---|---|
| | Different types of culture media and culture techniques including anaerobic culture methods. | Bacterial genetics and drug resistance in bacteria | |
| | Specimen Collection, Transport processing and Identification of bacteria | | Testing of disinfectants |
| | Infection-source, mode of transmission and types of infectious disease | | |
| Immunology | 1.Immunity<br>2.Antigen<br>3.Immunoglobulins<br>4.Structure and functions of immune system<br>5.Antigen -Antibody reactions<br>6.Immune response<br>7.Hypersensitivity<br>8. Auto immunity, classification with special reference to autoimmune disorders involving oral cavity.<br>9.Immunodeficiency disorders-various types and disorders relevant to dentistry<br>10.Immunology of transplantation and malignancy | Complement system<br><br>Immunohaematology | Flow cytometry in the diagnosis of malignancies<br>Vaccines against tumors |
| Systematic bacteriology | 1.Gram positive cocci - Staphylococcus, Streptococcus with special reference to Viridans group, Pneumococcus<br>2.Gram negative cocci – Meningococcus and Gonococcus<br>3.Corynebacterium diphtheria including immunoprophylaxis<br>4.Clostridium – Gas Gangrene, Tetanus and food poisoning<br>5.Mycobacteria- M.tuberculosis and M.leprae<br>6. Non sporing anaerobes – classification , pathogenesis, Laboratory diagnosis and treatment. | Enterobacteriaceae<br>Vibrio cholera | MDR and XDR TB<br><br>Agents of Bioterrorism |

| | | | |
|---|---|---|---|
| | 7.Spirochaetes- Treponema, Borrelia vincenti<br>8.Actinomycetes<br>9.Normal flora of oral cavity | | |
| Virology | 1.General properties, resistance<br>cultivation of viruses, host<br>virus interactions with special reference to interferon<br>2.Laboratory diagnosis , Viral vaccines<br>3.Herpes virus<br>4.Measles , Mumps and Rubella<br>5.Rabies virus<br>6.Hepatitis B and Hepatitis C virus,HBV vaccine<br>7.Human Immunodeficiency virus | Bacteriophage structure and significance<br><br><br>Cultivation of viruses | Influenza A and B viruses |
| Mycology | 1.Introduction,classification, Laboratory diagnosis<br>2.Candidosis,Rhinosporidiosis<br>3.Systemic mycoses and associated oral lesions. | Opportunistic fungal infections | Antifungal susceptibility testing methods |
| Parasitology | 1.Introduction , different modes of transmission and prevention<br>2.Entamoeba histolytica, Entamoeba gingivalis<br>3.Malarial parasites<br>4.Leishmania including L.brasiliensis<br>5.Common helminthic infections – Tape worms, Ascaris lumbricoides, Ancylostoma duodenale, Trichuris trichura and Enterobius vermicularis. | Protozoa<br>Giardia intestinalis, Trichomonas species.<br><br>Wuchereria bancrofti | Parasitic infections in HIV |
| Applied Microbiology | 1.Standard precautions<br>2.Infection control measures in dental setting<br>3.Significance of antibiotic susceptibility testing ,its interpretation<br>4.Bio medical waste management guidelines<br>5..Vaccination for Health care providers<br>6..Needle stick injury and post exposure prophylaxis<br>7.Blood borne infections | STD infections<br>Infective endocarditis<br>Emerging and Re emerging infections | Antibiotic resistance (MRSA,ESBL etc.) |

**Bioethics**

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.
In microbiology, the maintenance of confidentiality is very important for the laboratory to gain confidence from the patients. Confidentiality is mandatory in certain tests like HIV testing as the results may lead to alienation from the family thus causing mental agony to the patient. Counselling has to be given both before and after testing in HIV /AIDS setting. Written consent has to be always obtained from the patient for any procedure that can potentially harm the individual particularly invasive techniques.
Quarantining of people is done under special circumstances. By adhering to ethical guidelines, members of the medical profession can help and ensure that quarantine and isolation measures achieve their public health goals and maximally promote the well-being of individuals.

**7. PRACTICALS**

**Procedures**
i. Simple stain, Hanging drop
ii. Grams stain
iii. Ziehl Neilsen's stain

**Demonstrations**
i. Microscopy-Different types, parts, maintenance and usage
ii. Sterilization and disinfection
iii. Culture media including anaerobic culture media and transport media
iv. Anaerobic culture methods
v. Biochemical reactions in the identification of bacteria
vi. Virus models

## 8. THEORY EXAMINATION

Part B – Microbiology:

| | | | |
|---|---|---|---|
| Essay | 1 X 10 | = | 10 Marks |
| Short Notes | 3 X 5 | = | 15 Marks |
| Short Answers | 5 X 2 | = | 10 Marks |
| | | | --- |
| Total | | = | 35 Marks |
| | | | --- |

Note: Essay from Systematic Bacteriology/Virology, General bacteriology Immunology
Short Notes from Systematic bacteriology, Virology, Mycology, Parasitology, Applied Microbiology
Short Answers from General bacteriology, Immunology, Systematic bacteriology, Virology, Mycology, Parasitology and Applied Microbiology.

## 9. PRACTICAL EXAMINATION

| Contents | Marks | Time duration |
|---|---|---|
| Spotters (10x 2marks each) | 20 | 30mts |
| Gram staining (GPC,GNB,MIXTURE) | 10 | 45 mts |
| Ziehl Neilsen's staining | 10 | 60mts |
| *OSPE | 5 | 45mts |
| Total | 45marks | 180mts(3hrs) |

*OSPE Exercises Eg. Hand washing Technique
Bio medical waste segregation
OR any other relevant topic of choice
Note : For OSPE,key to be prepared and made available to the examiners .

**Viva – Marks 10**
To be conducted in the afternoon with appropriate time interval.

| | Examination | Internal Assessment | Viva | Total |
|---|---|---|---|---|
| Theory | 35 | 5 | 10 | 50 |
| Practicals | 45 | 5 | - | 50 |
| Total | | | | 100 |

**10. FORMATIVE /INTERNAL ASSESSMENT**

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Theory - 5 marks
Practicals - 5 marks
Total - 10 marks

**11. RECORD NOTE / LOG BOOK**

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

**12. TEXT BOOKS**

i. Text book of Microbiology – R.Ananthanarayan & C.K.Jayaram Paniker.
ii Medical Microbiology – David Greenwood etal.
iii. Textbook of parasitology – K.D.Chatterjee
iv. Paniker's Text book of Medical Parasitology

**13.BOOKS FOR FURTHER READING/REFERENCE**.

i. Microbiology – Prescott, etal.
ii. Microbiology – Bernard D. Davis , etal.
iii. Clinical & Pathogenic Microbiology – Barbara J Howard, etal.

iv. Mechanisms of Microbial diseases – Moselio Schaechter, etal.
v. Immunology –Donald M Weir
vi. Immunology 3rd edition – Evan Roitt , etal.
vii. Oral microbiology and infectious diseases –Burnett and Scherp
viii.Jawetz text book of microbiology

## 5. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

1. **GOAL**

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

2. **OBJECTIVES**

a) KNOWLEDGE AND UNDERSTANDING:

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 immunocompromised patients.
v. Integrate the rational drug therapy in clinical pharmacology.
vi. Indicate the principles underlying the concepts of “Essential drugs”.

b) SKILLS:

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

i. Prescribe drugs for common medical and dental ailments.
ii. 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.

c) ATTITUDE:

To develop the attitude to serve the rural community

d) INTEGRATION:

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

e) KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f) COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes.Basic operative skills in analysis of data and knowledge of multimedia.Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a) Operating system requirements
    b) Internet browser requirements
    c) Reliable and consistent access to the internet
    d) Antivirus software which is current and consistently updated
    e) Microsoft Office
    f) Adobe Reader (or equivalent to view PDF files)

## 3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies Specific to the subject

## 4. **TEACHING HOURS**

Lecture hours - 70 hours
Practical hours- 20 hours
Total – 90 hours

## 5. **TEACHING METHODOLOGY**

The objectives of teaching can be achieved by various teaching techniques such as :
a) Lectures
b) Lecture Demonstrations
c) Practical exercises
d) Audio visual aids
e) Small group discussions with regular feed back from the students
f) Integrated Teaching
g) Symposium and continuing medical education programmes.

## 6. **THEORY SYLLABUS**

- New drug development- clinical trials, biomedical ethics;
- Pharmacoeconomics;
- Pharmacovigilance

SYSTEMIC PHARMACOLOGY

| TOPIC | MUST KNOW | DESIRABLE TO KNOW | NICE TO KNOW |
|---|---|---|---|
| 1. | GENERAL PHARMACOLOGY | DRUGS ACTING ON CARDIOVASCULAR SYSTEM | VITAMINS: Water soluble vitamins, vitamin D, vitamin K, vitamin E, implications of vitamins in clinical dentistry. |
| 2. | ANTIBIOTICS | DRUGS ACTING ON CENTRAL NERVOUS SYSTEM | VACCINES |
| 3. | NSAIDS | DIURETICS | |
| 4. | DRUGS ACTING ON GI TRACT | DRUGS ACTING ON BLOOD | |
| 5. | LOCAL ANESTHETICS | GENERAL ANESTHETICS | |
| 6. | DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM | ANTINEOPLASTIC AGENTS | |
| 7. | INSULIN AND ORAL HYPOGLYCAEMIC DRUGS | | |
| 8. | CORTICOSTEROIDS | | |
| 9. | ANTISEPTICS AND DISINFECTANTS | | |

**Bioethics**

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

7. **PRACTICALS**

Procedures and demonstrations:
To familiarize the student with prescription writing and dispensing. Rational of drug combinations of marketed drugs

8. **THEORY EXAMINATION**

Elaborate on 2x10= 20 marks
Write notes 10x5 = 50 marks
**Total = 70 marks**

**9. PRACTICAL EXAMINATION**

Dispensing pharmacy 2x25= 50 marks
Prescription 2x10= 20 marks
OSPE 2x 10=20 marks
**Total 90 marks**

**Viva 20 marks**

| | Examination | Internal Assessment | Viva | Total |
|---|---|---|---|---|
| Theory | 70 | 10 | 20 | 100 |
| Practicals | 90 | 10 | - | 100 |
| Total | | | | 200 |

**10. FORMATIVE / INTERNAL ASSESSMENT**

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

Theory 10 marks
Practicals 10 marks
**Total 20 marks**

Topics for Internal Assessment
i. General Pharmacology
ii. Autonomic Nervous system
iii.Cental Nervous system
iv.Cardiovascular system
v. Respiratory system,Gastrointestinal system,autocoids
vi. Hormones
vii.Chemotherapy

## 11. RECORD NOTE / LOG BOOK

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/ teaching materials as specified in Dental Council of India regulation for the students during clinical /practical training and examinations.

## 12. TEXT BOOKS

i. Tripathi K D – Essentials of medical pharmacology
ii. R S Satoskar- Pharmacology and Pharmacotherapeutics
iii. Bertam G Katzung- Basic and clinical pharmacology

## 13. REFERENCE BOOKS


i. Goodman and Gilman- The Pharmacological basis of Therapeutics.
ii. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacotherapentics, 10th Edition, Bombay Popular Prakashan 1991.
iii. Bertam G Katzung, basic and Clinical pharmacology 6th ed.Appleton & Lange 1997.
iv. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997.
v. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part ii, 13th Popular Prakashan Bombay 1993.
vi. Tripathi K.D., Essentials of Medicla Pharmacology 4th ed Jaypee Brothers 1999.

## 6. DENTAL MATERIAL

1. **GOAL**

The dental graduates during training in the institutions should acquire adequate knowledge, necessary skills and such attitudes which are required for carrying out all the activities appropriate to general dental practice involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. 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 about the various materials. The broad goal of the teaching of undergraduate students in Dental Materials aims at providing adequate fundamental knowledge about the materials available in the Dental science. .

2. **OBJECTIVES**

The objectives are dealt under three headings namely (a) knowledge and understanding (b) skills and (c) attitudes.

a. KNOWLEDGE AND UNDERSTANDING:

The graduate should acquire the following during the period of training --- Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data. To understand the evolution and development of science of dental materials. To know about the manipulation technique of various restorative materials.

b. SKILLS:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry. To develop skills in the management of various materials in dentistry. Students should know about the physical and chemical properties of the dental materials

c. ATTITUDE:

A graduate should develop during the training period the following attitudes. Willing to apply current knowledge of dentistry in the best interest of the patients and the community. Maintain a high standard of professional ethics and

conduct and apply these in all aspects of professional life. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time. To help and to participate in the implementation of National Health Programmes.

d. INTEGRATION:

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY:

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. Computer Proficiency

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia.Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
   a) Operating system requirements
   b) Internet browser requirements
   c) Reliable and consistent access to the internet
   d) Antivirus software which is current and consistently updated
   e) Microsoft Office
   f) Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis

5. Patient Care - Treatment Planning
6. Competencies specific to the subject

4. **TEACHING HOURS**

Teaching hours for first and second years- Theory and Practical are shown in the Tables-I
TABLE - I Subjects and Hours of Instruction (B.D.S Course)

TOTAL TEACHING HOURS FOR FIRST AND SECOND B.D.S

| Sl No | Subject | Lecture Hours | Practical Hours | Clinical Hours | Total HOURS |
|---|---|---|---|---|---|
| 1. | Dental Materials | 80 | 240 | - | 320 |

**Subjects and Hours of Instruction for First year B.D.S**

| Sl No | Subject | Teaching Hours | Practical Hours | Clinical Hours | Total |
|---|---|---|---|---|---|
| 1. | Dental Materials | 20 | 40 | _ | 60 |

**Subjects and Hours of Instruction for Second year B.D.S**

| Sl No | Subject | Lecture Hours | Practical Hours | Clinical Hours | Total Hours |
|---|---|---|---|---|---|
| 1. | Dental Materials | 60 | 200 | -- | 260 |

5. **TEACHING METHODOLOGY**
The objective of teaching can be achieved by various teaching tech such as

i. Lecture
ii. Demonstration
iii. Practical exercises
iv. Audio Video aids
v. Group discussion
vi. Integrated teaching

**Titles of subjects of study**

First Year

Dental Materials.

Second Year

Dental Materials.

6. **THEORY SYLLABUS**

| TOPICS | MUST KNOW | DESIRABLE TO KNOW | NICE TO KNOW |
|---|---|---|---|
| Introduction | Brief History of the development of the science of Dental Materials. Aim of studying the subject of Dental Materials. Scope and requirements of Dental materials . Spectrum of materials - Classification Clinical and laboratory applications | | |
| Structure of matter, and principles of adhesion | 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., | Change of state<br>Interatomic bonds<br>Crystalline structure<br>Non crystalline solids and their structure | |
| Important Physical properties | Hue, value, chrome. and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal | | |

| | | | |
|---|---|---|---|
| applicable to dental. Materials | conductivity & coefficient of thermal expansion, 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 resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic 6reep, flow, colour, three dimensional colour - hue, values, chrome., Munsell system, metamerisim, fluorescence. | | |
| Biological considerations in use of dental materials. | Classification of materials from perspective of biological compatibility | Micro leakage, Thermal changes, Galvanism, toxic effect of materials | Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity. |
| Gypsum & gypsum products | Gypsum - its origin, chemical formula.<br><br>Dental plaster, Dental stone, Die stone, high strength, high expansion stone.<br><br>Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Commercial names.<br><br>Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material.<br><br>Setting time: working time and | Recent methods or advanced methods. | Disinfection of dental materials for infection control.<br><br>Any recent advancements in material and mixing devices. |

| | | | |
|---|---|---|---|
| | Measurement of setting time and factors controlling setting time.<br>Setting expansion, Hygroscopic setting expansion<br><br>Factors affecting each Strength: wet strength, dry strength, factors affecting strength.<br><br>ADA classification of gypsum products Description of impression plaster and dental investment Manipulation<br><br>Disinfection : infection control, liquids, sprays, radiation<br><br>Method of use of disinfectants Storage of material - shelf life | | |
| Impression materials used in dentistry<br><br>. | Impression plaster, Impression compound, Zinc oxide eugenol impression paste & bite registration paste incl., non eugenol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether.<br><br>Definition of impression ., Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material. Application and their uses in different disciplines,<br>Type of impression trays required, Adhesion, to Tray, manipulation, instruments &equipment's required. Techniques of impression, storage | Visible light cure polyether urethane dimethacrylate, Historical background , development Of each impression material, | |

| | | | |
|---|---|---|---|
| | of impression, Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, compatibility with cast & die materials incl., electroplating, Biological properties:.tissue reaction Shelf life & storage of material, Infection control - disinfection,.Advantages and disadvantages of each material. | | |
| Synthetic resins used in dentistry. | Classification of resins, Dentalresins. Requirements of dental resins, applications, polymerisation, polymerisation mechanism.<br><br>Stages in addition polymerisation, inhibition of polymerisation, copolymerisation, molecular weight, crosslinking, plasticisers.<br>Physical properties of polymers, polymer structures types of resins.<br>ACRYLIC RESINS: Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each.<br>Physical properties of denture base resin.<br>Composite<br>RESTORATIVE RESIN: Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation Shrinkage Classification of Composites: Application, composition arid properties of each.<br>Biocompatibility ,-- micro leakage, pulpal reaction, pulpal protection Manipulation of composites: | Historical background and, development of material.<br><br>Miscellaneous resins & techniques: Repair resins, Relining and rebasing.<br><br>Infection control in detail, Biological properties and allergic 'reactions.<br><br>Measurement of bond strength and micro leakage<br><br>Amalgam Bonding<br><br>Pit and fissure sealants. | 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.<br><br>Composites of posterior teeth, Prosthodontics resins for veneering.<br><br>Repair of composite.<br><br>Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlay system<br>Indirect & direct, Core build up, Orthodontic applications. |

| | | | |
|---|---|---|---|
| | Techniques of Insertion of Chemically activated, light, activated, dual cure Polymerisation, Finishing and polishing of restoration, Direct Bonding: Need for bonding, Acid' etch technique,, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. | Restorative Resins<br>Depth of cure<br>Degree of conversion, Dual Cure resins | **Restorative Resins**<br>Curing lamps<br>Depth of cure<br>Reduction of residual stresses |
| Metal and alloys | Structure and behaviour of metals,<br>Classification of casting alloys: By function & description.<br>Alloys for crown & bridge, metal ceramic & removable partial denture. Composition,, function, constituents and application. | Historical background, desirable properties of casting alloys<br>Factors affecting success of amalgam | An alternative to metal casting process. Cad-cam process for metal & ceramic inlays |
| | **Dental Amalgam**<br>Composition,Manufacturing of alloy powder,Amalgamation,Dimensional Stability,StrengthCreep,Clinicalperformance,Proportioning,Trituration,Condensation,Carving and finishing, Dimensional Change, Mercury hygiene | Side effects of mercury<br>Repair of amalgam restoration | |
| Direct filling gold | Properties of pure gold<br>Classification and forms of DFG<br>Removal of surface impurities | History,<br>Compaction<br>Direct gold restoration | |

| | | | |
|---|---|---|---|
| Dental casting alloys | Classification of casting alloys: By function & description.<br>Recent classification High noble (HN); Noble (N) and predominantly base metal (PB).<br>Alloys for crown & bridge, metal ceramic & removable partial denture. Composition,function, constituents and application, each alloy both noble and' base metal. Propertiesof alloys: Melting range, mechanical properties, hardness, and elongation, modulus ofelasticity, tarnish and corrosion.<br>Casting shrinkage and compensation of casting shrinkage. Biocompatibility – Handling hazards. & precautions of base metal alloys, casting investments used.<br><br>Heat treatment :Softening & hardening heat treatment | 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<br>process for metal & ceramic inlays - without need for 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 ofCAD- CAM technology . Another method of making copings - by copy milling (without casting Procedures |
| Dental waxes including inlay casting wax | Introduction and importance of waxes.<br><br>Sources of natural waxes and their chemical nature.<br><br>Classification of Waxes: Properties of Dental wax, Inlay wax.<br><br>Mode of supply composition, Ideal requirements.Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode: Classification & composition, | . | Manipulation of inlay wax: Instruments & equipment required.<br><br>Impression wax for corrective impressions, Bite registration wax. |

| | | | |
|---|---|---|---|
| Dental casting investments. | Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.<br><br>Definition, requirements, classification Gypsum bonded - classification. Phosphate bonded, 'Silica bonded'.<br><br>Mode of Supply:,Composition, application , setting mechanism, setting time & factors controlling it.<br><br>Expansions :Setting expansion, Hygroscopic Setting expansion, & thermal expansion :<br><br>Factors affecting. Properties: Strength, porosity, and fineness & storage. Technical considerations: | | Casting procedure, Preparation of die, Wax pattern, spruing, investing, and control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting. |
| Soldering, brazing and welding | Need of joining dental appliances, temperature, and application. Mode of supply of solders, Composition and selection, Properties.<br>Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint<br>Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection<br>Welding: Definition, application, requirements,and procedure. | Technique of Soldering & Brazing : free hand soldering and investment, steps and Procedure. | weld decay - causes and how to avoid it. Laser welding.<br><br>Titanium alloys, application, composition, properties, welding, Corrosion resistance |
| Wrought base metal alloys | Applications and different alloys used mainly for orthodontics purpose<br>1. Stainless steel<br>2. Cobalt chromium nickel<br>3. Nickel titanium<br>4. Beta titanium | | |

| | | | |
|---|---|---|---|
| | Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, biocompatibility<br>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<br>1.Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, Physical properties<br>2. Nickel - Titanium alloys, shape, memory & super elastic | | |
| Dental cements | 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.<br>Definition & Ideal requirements.<br>Fluoride releasing cements<br>Luting cements<br>Agents for pulp protection<br>Zinc Phosphate cement<br>Zinc Polycarboxylate Cement<br>Glass ionomer cement | | Modifications and recent advances, Principles of cementation.<br>Special emphasis on cavity liners and cement bases and luting agents. |

| | | | |
|---|---|---|---|
| Dental ceramics | Resin Cements<br>Zinc oxide eugenol cement<br>Calcium Hydroxide<br><br>General applications. Dental ceramics: properties definition, classification,application, mode of supply, manufacturing procedure, methods of strengthening.Properties of fused ceramic:. Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, aesthetic properties, biocompatibility, technical considerations. Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition. | Historical background.<br><br>Methods of strengthening.<br><br>Metal Ceramics (PFM).Metal Ceramic Bond.Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations of porcelain and porcelain fused metal restorations. | Recent advances - all porcelain restorations, Manganese core, injection moulded, cast able ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and on lays, and CAD - CAM ceramic. |
| Abrasion & polishing agents | Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminium oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic | Technical consideration - Material and procedure used for abrasion and polishing, | |

| | | | |
|---|---|---|---|
| Die and counter die materials<br><br>Mechanics of cutting<br><br>Dental implants | oxide, sand, carbides, diamond, zirconium silicate, Zinc oxide<br><br>Desirable 'characteristics of an abrasive, Rate of abrasion, Size of particle, pressure, Grading of abrasive & polishing agents. Binder, Polishing materials & procedures<br><br>Types - Gypsum products, Electroforming, Epoxy resin, Amalgam.<br><br>Burs and points. | | Evolution of dental implants, - types and materials. |

**Bioethics**

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics

BIO-ETHICS

1) Respect human life with dignity
2) Refrain from supporting crimes against humanity
3) Treat the sick with compassion
4) Protect the privacy of the patient
5) Educate the public
6) Fight for socio economical changes
7) Teaching and mentoring those who follow us

## 7. PRACTICAL

Practical Exercises: 240 Hours
Demonstration of manipulation of all materials
Exercises to be done by each student:

a. Manipulation of Gypsum- Materials and Alginate - identify setting time and working time and working time with reference to proportion, water temp, and spatulation time.
b. Self-cure and heat cure acrylic resin manipulation and curing.
c. Cements - manipulation and studying setting time and working time for luting, base & restoration. Zinc oxide eugenol,zinc phosphate,glass ionomer .
d. Silver Amalgam - manipulation, trituaration.

## 8. **THEORY EXAMINATIONS: (3 Hours)**

| | | |
|---|---|---|
| Elaborate on | 2 X 10 | = 20 marks |
| Write Notes | 10 X 5 | = 50 marks |
| | | --- |
| Total | | 70 marks |
| | | --- |

Note : One Elaborate on Question from Conservative Dentistry topics and one Elaborate on Question from Prosthodontics topics
Write Notes : Four Questions from conservative and four questions from Prosthetic topics and two questions from Metallurgy and orthodontia.

II Exercise to be done by each FIRST B.D.S student:

a. Impression material Manipulation - 20 hours
b. Gypsum products - 20 hours

## 9. PRACTICAL / CLINICAL EXAMINATIONS:-

I. i. Spotters: Identify and write the composition and two important uses:
ii. Spotters – 20 Nos. 20 X 2 = 40 marks
Time – 2 Minutes each

II. Exercise No.1
Any one exercise of the following 25 Marks
i. Manipulation of Dental plaster and stone
ii. Manipulation of alginate impression material
iii. Manipulation of Zinc Oxide Eugenol impression paste
iv. Manipulation of heat cure acrylic resin

III. Exercise No. 2 25 Marks
Manipulation of any one of the following Dental Cements.
a. ZOE (Luting and Filling consistency)
b. Zinc Phosphate Cement (Luting and Base consistency)
c. Glass lonomer Cement Type I/II (Luting/Filling consistency)
d. Silver Amalgam Trituration

TIMING FOR MANIPULATION

2-5 Minutes may be allotted for each mixing exercises

Viva 20 Marks

| | Examination | Internal Assessment | Viva | Total |
|---|---|---|---|---|
| Theory | 70 | 10 | 20 | 100 |
| Practicals | 90 | 10 | - | 100 |
| Total | | | | 200 |

## 10. FORMATIVE / INERNAL ASSESSMENT:

The continuing assessment examination (both Theory/Practical) held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

## 11. RECORD NOTE / LOG BOOK:

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

## 12. TEXT BOOKS

| **Name of the Book & Title** | **Author** | **Edn** | **Yr. of Publ.** | **Publ.'s Name Place of Publ.** |
|---|---|---|---|---|
| Science of Dental Materials | Kennet. J. Anusavice | 11th | 2007 | W.B. Sunder's Company, USA |
| Notes on Dental Materials | E.C. Combe | 06th | 1992 | Churchill Livingstone, UK |
| Applied Dental Material | John. F. Mc. Cabe | 07th | 1992 | Oxford Blackwell Scientific pub. London |
| Text Book of Dental Material | Craig. | 06th | 1996 | Mosby, USA |
| Restorative Dental | O. Brien Craig. | 11th | 2002 | Mosby, USA |

LIST OF SPOTTERS
CONSERVATIVE SPOTTERS:
1. Amalgam Alloy Powder

2. Mercury
3. Amalgam Capsule
4. Acid Etchant
5. Dentin Bonding Agent
6. Cavity Varnish
7. Dentin Conditioner
8. Composite Resin
9. Zinc Oxide Eugenol Cement
10. Modified Zinc Oxide Eugenol Cement (Irm – Intermediate Restorative Material)
11. Zinc Phosphate Cement
12. Zinc Polycarboxylate Cement
13. Glass Ionomer Cement Type I
14. Glass Ionomer Cement Type Ii
15. Calcium Hydroxide
16. Inlay Wax
17. Base Metal Alloy Pellets
18. Casting Ring
19. Gypsum Bonded Investment
20. Phosphate Bonded Investment
21. Dental Bur
22. Wooden Wedges
23. Gutta Percha Points
24. Gutta Percha Sticks
25. Motor And Pestle
26. Glass Slab
27. Cement Spatula
28. Agate Spatula

**Prosthodontics spotters**

1. plaster of paris
2. die stone
3. dental stone
4. gypsum bonded investment

5. zinc oxide eugenol impression paste
6. rubber base materials
7. alginate
8. impression compound
9. low fusing compound
10. sticky wax
11. shellac base plate
12. modelling wax
13. heat cure resin
14. self cure resin
15. metal pellets
16. casting ring
17. stainless steel wire
18. acrylic trimmers
19. separating media
20. acrylic teeth set
21. cotton puff
22. wollen puff
23. metal ceramic bridge

**Miscellaneous**

1. Infection control
2. Artificial tooth material.
3. Separating media
4. Die spacers
5. Tray adhesives
6. Petroleum jelly
7. Articulating paper
8. Pressure indicating paste
9. Endodontic materials
10. Comparative studies between metallic and nonmetallic denture base Bioglass
11. Sprues

12. Setting expansion, hygroscopic expansion, thermal expansion
13. Dentifrices.

## 13. REFERENCE BOOK:

1. Phillips Sciences of Dental Materials – 10th edn. –Kenneth J. Anusavice
2. Restorative Dental Material – 10 edn. Robert G.Craig
3. Notes on Dental Materials – E.C.Combe

## 7. PRE CLINICAL CONSERVATIVE DENTISTRY

1. **GOAL**

The IInd year BDS undergraduate students during the training in the preclinical conservative dentistry should acquire adequate knowledge, skills and attitude which are required for carrying out appropriate activities in dental practice which involves diagnosis treatment and prevention of disease of teeth. During the training program they should be able to identify and use instruments which are used in conservative dentistry and Endodontics. They should also be aware of various restorative procedures with emphasize on tooth conservation.

2. **OBJECTIVES**

The objectives are dealt under following headings

a. KNOWLEDGE AND UNDERSTANDING:

The student should acquire adequate knowledge during this period of training. Knowledge of the scientific foundation of conservative dentistry and understanding of various treatment procedures carried out in conservative dentistry with emphasize on biological principal to be followed during these treatment procedures and to acquire knowledge of various instruments and materials used in restorative procedures .They should also be aware of various manipulative techniques of restorative material.

b. SKILLS;

The students should be able to demonstrate the following skills which are necessary for practice in conservative dentistry
To develop skills in manipulation of various materials used in conservative dentistry. To develop skills in preparation of various cavities and to perform various restorative procedures.

c. ATTITUDE;

The student should be able to apply the current knowledge of various materials used in dentistry in the interest of patients and the community in general. To be aware of recent developments in instruments and materials used in conservative dentistry and update his/her knowledge by attaining various continuing education programmes. Should be aware of both

benefits and health hazards of various restorative materials used in conservative dentistry. Should maintain high standard of professional ethics and apply those in all aspects of professional life.

d. INTEGRATION:

The dental student must be able to identify the healthy and diseased state of the teeth, thereby enabling them to better understand the diseased state and to plan an ideal treatment protocol for the same.

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

3**. COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources

4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies Specific to the Subject

## 4. **TEACHING HOURS**

During II nd year BDS

| | |
|---|---|
| Lecture | 25 hours |
| Practical | 200 hours |
| Total | 225 hours |

## 5. **TEACHING METHODOLOGY**

Audio Visual Aids: LCD projectors
Identification of instruments used in preclinical dentistry.

Demonstration of various procedures in conservative dentistry.
Demonstration of endodontic procedures in single rooted teeth.

## 6. **THEORY SYLLABUS**

| TOPIC | MUST KNOW | DESIRABLE TO KNOW | NICE TO KNOW |
|---|---|---|---|
| 1. | Introduction to conservative dentistry | | |
| 2. | Definition and scope of conservative dentistry and Endodontics | | |
| 3. | Classification of cavities | | |
| 4. | Nomenclature | | |
| 5. | Various chair side positions | | |
| 6. | Tooth numbering | | |

| | | | |
|---|---|---|---|
| 7. | Dental caries | | |
| 8. | Restoration -Definition and objectives | | |
| 9. | Instrument classification ,nomenclature design formula of hand cutting instrument, grasps and rests | | |
| 10. | Rotary cutting instruments, bur design, abrasives and various speeds in rotary instruments.<br>Principle of cavity preparation for<br>(a) Silver amalgam<br>(b)Cast gold inlays<br>(c)Composite resin<br>(d)Glass ionomer | | |
| 11. | Matrices, Retainers and wedges | | |
| 12. | Separators -Different methods of separation | | |
| 13. | Finishing and polishing of restorations | | |
| 14. | Management of deep carious lesions- pulp capping and pulpotomy | | |
| 15. | Access cavity preparation and brief introduction of instruments used endodontics. | | |
| 17. | | | Infection control |
| 18. | | | Conservative aesthetic procedures |
| 19. | | | Bleaching |
| 20. | | | Complex amalgam restorations |
| 21. | | | Direct filling gold |

**Bioethics**

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

## 7. PRACTICALS:

**Practical exercise: 200 hours**

Preparation of 1 inch cube in plaster of paris-4 Nos
Preparation of geometric cavities in prepared cubes.
Preparation of tooth models in plaster and preparation of cavities and restoration with modelling wax

a) Incisors -3 Nos
b) Premolars- Upper Premolars -2 Nos; Lower Premolars- 2Nos
c) Molars - Upper Molars 4 Nos; Lower Molars-4Nos

Preparation of Cavities on Extracted Natural Teeth Class I, Class II and MOD and Class V Cavity Preparation. Base Application, Matrix and Wedge Placement, Placement of restoration.

1. Cavities:

| S no | Cavities | Preparation | Restoration |
|---|---|---|---|
| | Class I | 5 | 5 |
| | Class I with extensions | 2 | 2 |
| | Class II<br>DO conventional<br>MO conventional<br>Conservative preparation in Upper molar | 10 | 10 |
| | Class II MOD | 2 | 2 |
| | Class III and V | 4 | 4 (glass ionomer) |
| | Class V | 2 | 2(amalgam) |

**Finishing and polishing of above restorations**

Inlay preparation:
Class II preparation
Wax pattern
Sprue attachment
Investment
Casting and finishing
Endodontics
Identification of basic endodon tic instruments
Access cavity preparation in upper central incisors
Working length determination
Cleaning and shaping
Obturation of the root canal
Access seal

Demonstration**:**
Demonstration of class III, class V and incisal edge restoration on extracted teeth with composite resin
Finishing and polishing of the restorations
Identification and manipulation of cavity varnishes, bases like zinc phosphate, zinc poly carboxylate, zinc oxide eugenol cement
Manipulation of glass ionomer cement
Manipulation of amalgam
Identification and demonstration of placement of different types matrix retainers, matrices and tooth seperators.
Demonstration of light cure composite and glass ionomer Restoration

Endodontics:
(a) Pulp capping direct indirect on extracted teeth
(b) Pulpotomy on extracted posterior teeth
(c) Root canal access cavity opening on upper Central Incisor (extracted teeth)
Demonstration of instrumentation and obturation of root canal

**8. Theory Examination**

No Theory Examination

**9 .PRACTICAL EXAMINATIONS:**

**Practical exercise:**

Preparation of class II cavity for Silver amalgam in maxillary or mandibular molar tooth (typhodont tooth)

| S.no | Excercise | Marks | Time |
|---|---|---|---|
| 1 | Cavity Preparation | 30 | 45 Minutes |
| 2 | Base and Matrix | 10 | 15 Minutes |
| 3 | Restoration and Finishing | 20 | 30 Minutes |
| | | --- | |
| | Total | 60 marks | |
| | | --- | |

**Viva – voce** - 20 Marks

**SCHEME OF EXAMINATION:**

Internal assessment - 20 marks
Practical - 60 marks
Viva voce - 20 marks
Total - 100 marks

**10. FORMATIVE/INTERNAL ASSESSMENT:**

The continuing assessment examination held at least 3times in a particular year and best of two examinations shall be considered. The Internal Assessment marks to be submitted to the university, once in every three months. The marks scored by the students shall be displayed on the Notice board and a copy forwarded by HOD shall be sent to the University once in every 3 months.

**11. RECORD NOTE / LOG BOOK**:
Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical / practical training and examinations.

**12. TEXT BOOKS:**
**TEXT BOOKS RECOMMENDED**
**NAME OF THE BOOKS, AUTHOR, PUBLISHER**
Sturdevant's Art and Science of Operative Dentistry, ELSEVIER
Pre - Clinical Manual of Conservative Dentistry, Dr.V.Gopikrishna, ELSEVIER

## 8. PRE CLINICAL PROSTHODONTICS &CROWN & BRIDGE

### 1. GOAL

The dental graduates during training in the institutions should acquire adequate knowledge, necessary skills and reasonable attitudes which are required for carrying out all activities appropriate to general dental practice involving prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The graduate also should understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

### 2. OBJECTIVES

a. KNOWLEDGE

i) Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions, ability to evaluate and analyse scientifically various established facts and deals.

ii)Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient.

iii)Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry.

iv)Adequate clinical experience required for the general dental practice.

v)Adequate knowledge of the constitution, biological functions and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health in so far as it affect dentistry.

b. ATTITUDE

A graduate should develop during the training period the following attitudes.

i. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community.
ii. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
iii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.
iv. Willingness to participate in the CPED programmes to update knowledge and professional skill time to time.
v. Help and participate in the implementation of the national oral health policy.

c. SKILLS

A graduate should be able to demonstrate the following skills necessary fro practice in dentistry.

i. Diagnose and mange various common dental problems encountered in general dental practice keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible.
ii. Prevent and manage complications if encountered while carrying out various surgical and other procedures.
iii. Carry out certain investigative procedures and ability to interpret laboratory findings.
iv. Promote oral health and help prevent oral disease where possible.
v. Control pain and anxiety among the patients during dental treatment.

d. INTEGRATION

Integrated knowledge about all the divisions in Prosthodontics (CD,RPD,FPD,IMPLANTS etc)

e. KNOWLEDGE ABOUT INFECTION AND CROSS INFECTION IN DENTISTRY

Knowledge about asepsis – disinfection and sterilization of instruments, clinical area / personal care as per universal protection, and disposal of medical wastes in the appropriate modes. Students should be aware of the rules and regulations pertaining to maintenance of clinical set up and waste disposal.

f. COMPUTER PROFICIENCY

Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes. Basic operative skills in analysis of data and knowledge of multimedia. Students should utilize a combination of traditional classroom courses, and online courses. The following validation is required and must be completed.

i. Technological Requirements for all Graduate Students
ii. A laptop or desktop computer that supports the following requirements
    a. Operating system requirements
    b. Internet browser requirements
    c. Reliable and consistent access to the internet
    d. Antivirus software which is current and consistently updated
    e. Microsoft Office
    f. Adobe Reader (or equivalent to view PDF files)

3. **COMPETENCIES**

1. General skills
2. Practice Management
3. Communication and Community Resources
4. Patient Care – Diagnosis
5. Patient Care - Treatment Planning
6. Competencies Specific to the Subject

4. **TEACHING HOURS**

During I$^{st}$ Year BDS - 100 Practical hours
During II $^{nd}$ year BDS

| | |
|---|---|
| Lecture | 25 hours |
| Practical | 200 hours |
| Total | 225 hours |

## 5. TEACHING METHODOLOGY

The objectives of teaching microbiology can be achieved by various teaching techniques such as :
a) Lectures
b) Lecture Demonstrations
c) Practical exercises
d) Audio visual aids
e) Small group discussions with regular feed back from the students
f) Integrated Teaching
g) Symposium and continuing medical education programmes and Computer Aided Study

## 6. **THEORY**

### I. Introduction to Prosthodontics - Scope and Definition

A. Masticatory apparatus and function:

1. Maxillae & Mandible with & without teeth.
2. Muscles of mastication and accessory muscles of mastication.
3. Brief anatomy of TMJ.
4. Mandibular movements.
5. Functions of teeth.

B. Various branches of Prosthodontics and prosthesis:

1. Scope & limitation.
2. Appliances v/s prosthesis.
3. Dental prosthesis v/s non-dental prosthesis.

C. Effect of loss of teeth:

1. On general health.
2. On masticatory apparatus.
3. Need of replace lost teeth.

D. Outline of Prosthodontics:

1. Types of Prosthesis.
2. Requirements of prosthesis- Physical, biological, esthetic considerations.

**II. Introduction to components of Prosthesis**

A. Complete Denture Prosthesis:

1. Various surfaces (Border and surface anatomy).
2. Components - Base and Teeth.

B. Removable Patial Denture:

1. Classification.
2. Major and minor Connectors.
3. Direct retainers.
4. Rests.
5. Indirect retainers.
6. Denture base.
7. Artificial teeth.

C. Fixed Partial Denture:

1. Classification.
2. Retainers.
3. Pontics.
4. Connectors.

## III. All related definitions and terminologies from glossary

1. Model
2. Cast
3. Impression
4. Occlusion rim
5. Temporary denture base
6. Permanent denture base
7. Occlusion
8. Face Bow & Articulator
9. Jaw relation - orientation, vetical and centric
10. Christensten's phenomenon
11. Key of occlusion
12. Balanced occlusion
13. Abutment etc…

## IV. Introduction to mouth preparation - in brief

A. Complete Dentures

1. General considerations
2. Pre-prosthetic surgery

B. Removable partial dentres

1. General considerations
2. Occlusal rest preparation
3. Modifying conours of the abutments
4. Guide planes
5. Elimination of undercuts

C. Fixed Partial Dentures

1. Principles of tooth preparation - in brief
2. Retainers in brief

**V. Introduction to all steps involved in fabrication of Prosthesis**

Clinical Steps in brief and laboratory steps in detail

A. Impression Making

1. Definition and requirements and types of impressions
2. Various materials used for different impressions
3. Different theories of impression making

B. Impression Trays

1. Definition, classification, materials, advantages and disadvantages
2. Selection of trays
3. Special trays
4. Spacer design

C. Introduction to jaw relation record

1. Definition and type
2. Temporary denture base - Indications, Advantages, Disadvantages,materials used
3. Occlusion rims - materials, shape, dimensions
4. Clinical procedures of jaw relation recording in brief

D. Articulators and Face bow

1. Basic out line
2. Need for articulators
3. Definition, classification, parts, advantages, disadvantages of articulators
4. Definitions, classification, parts, advantages, disadvantages and purpose of face bow transfer
5. Demonstration of face bow transfer to an articulator on a dummy

E. Selection of Teeth

1. Various guidelines for selection of teeth including dentogenic concept
2. Arrangement of teeth in detail with various factors of esthetics, overjet, overbite etc

F. Occlusion

1. Balanced Occlusion - need and advantages
2. Various factors of balanced occlusion

G. Try in Procedures

1. Anterior try - in
2. Posterior try - in
3. Waxing, carving, polishing and final try - in

H. ProcessingProcedures

1. Flasking
2. Dewaxing
3. Packing
4. Curing
5. Finishing and polishing of acrylic dentures

**VI.Casting Procedures**

1. Preparation of die
2. Wax pattern
3. Investing
4. Burnout
5. Casting
6. Finishing and polishing

**Bioethics**

Bioethics is the application of ethics to the field of medicine and healthcare. Bioethics includes medical ethics, which focuses on issues in health care; research ethics, which focuses issues in the conduct of research; environmental ethics, which focuses on issues pertaining to the relationship between human activities and the environment, and public health ethics.

**7. PRACTICAL EXCERCISES**

1. Preparation of special trays
2. Preparation of temporary and permanent denture bases
3. Preparation of occlusion rims
4. Orientation of occlusion rims on articulator
5. Arrangement of teeth
6. Processing of complete dentures

1. Arrangement of teeth - Must Know
2. Surveying of partially edentulous models and preparing modified master cast - Desirable to Know
3. Preparing of was patterns spruing, casting and finishing ( in batches of students not more than 8)
- Desirable to Know
4. Preparation of plaster models of various preparation of teeth to receive retainers for FPD
- Desirable to Know

5. Prepare wax patterns for minimum of 3 unit FPD and investing, casting and porcelain facing (for Batch of 8 students) - Desirable to Know

Note:

1. Students shall submit one processed denture mounted on an articulator to present on university practical exam along with record book.
2. Exercises of RPD and FPD to be submitted in groups along with the record book

**8. Theory Examination**

No Theory Examination

**9. Practical Examination:**

A. Practical Exercise: (Duration-3 hrs) : 60 Marks

Arrangement of teeth in class I relation, Waxing, Carving, Polishing

B. Viva-Voce 20 Marks

C. Internal Assessment 20 Marks

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11. **RECORD / LOG BOOK**:

Record shall be maintained and assessed periodically by faculty and HOD. Institution shall provide adequate teaching number of cases/teaching materials as specified in Dental Council of India regulation for the students during clinical/practical training and examinations.

## 12. TEXT BOOKS

1. Essential of Complete Denture Prosthodontics - Winkler
2. Prosthodontic Treatment for Edentluous Patients - Zarb Bolender
3. Clinical Removable Partial Denture - Stewart
4. Fundamentals of Fixed Prosthodontics - Shillingburg
5. Text Book of Prosthodontics - Deepak Nallaswam

## 13. REFERENCE BOOKS

1. Impression Techniques for Complete Denture - Bernard Levin
2. Removable Partial Prosthodontics - Mc Cracken
3. Contemporary Fixed Partial Denture - Rosenstiel
4. Syllabus of Complete denture by – Charles M. Heartwell Jr. and Arthur O. Rahn.
5. Boucher's "Prosthodontic treatment for edentulous patients"
6. Essentials of complete denture prosthodontics by – Sheldon Winkler
7. Maxillofacial prosthetics by – Willam R. Laney
8. McCraken"s Removable partial prosthodontics
9. Removable partial Prosthdontics by – Ernest L.Miller and Joseph E. Grasso.