Revised Ordinance Governing

BACHELOR OF DENTAL SURGERY (BDS)

Degree Course 2011

RAJIV GANDHI UNIVERSITY OF
HEALTH SCIENCES KARNATAKA

I BDS
DENTAL MATERIALS

Sl. No.	Theory - 20 Hrs. Practical - 40 Hrs.	Total 60 Hrs.
1.	**Introduction:** a. Brief History of the development of the science of Dental Materials b. Aim of studying the subject of Dental Materials. c. Scope and requirements of Dental materials d. Spectrum of materials - Classification Clinical and laboratory applications	01
2.	**Structure and behaviour of matter:** a.Basic principles - Physical and mechanical properties, Chemical properties, biological properties, rheological properties, thermal properties, light, colour and esthetics. Tarnish and corrosion, surface properties and adhesion, biocompatibility allergy, toxicity, setting reactions. b. Enamel and Dentine and bone. c. Polymers d. Metals and alloys e. Ceramics f. Composites g. Standardisation and assessment of dental materials.	02
3.	**Impression materials and duplicating materials:** a. Requirements, classification. b. Desirable properties, composition, setting properties, advantages, disadvantages, indications and manipulation of inelastic and elastic materials. (Tray compound, impression compound, Low fusing compound, Impression plaster, Zinc oxide Eugenol impression paste, Non Eugenol paste, Alginate, Agar Elastomeric impression materials) Comparative studies between all.	03
4.	Gypsum products (Detail), die, cast and model materials (including brief account of electroformed dies):	02
5.	Waxes and baseplate materials - Contents, properties, manipulation and uses (Modeling wax, casting wax, boxing wax, utility wax, Sticky wax, impression wax, carding wax, preformed wax patterns	02
6.	**Denture base resins** a. Tray materials. b. Temporary base materials - contents, properties, manipulation, advantages and disadvantages.	02

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	c. Permanent base resins - types, composition, properties and technical consideration (Flasking, packing, curing, deflasking and processing errors) d. Others - Tissue conditioners, soft liners and hard liners.	
7.	**Tooth restorative materials - Classification and ideal properties :** a. Dental cements - classification ideal requirements of liners, base and luting cements. Composition, properties, chemistry of setting, manipulation and uses of silicate and silico phosphate cements (in brief), zinc phosphate, zinc polycarbxylate, calcium hydroxide, glass ionomer, modified glass ionomer and resin cement. Comparative studies of mechanical, biological and esthetic properties of all cements.	10
8.	Metals and Alloys - Solidification and microstructure of metals, classification of alloys, relevant physical and mechanical properties, annealing, heat treatment, soldering, welding, fluxes and ant fluxes.	03

Practical Exercises : 40 Hours

II Exercises to be done by each student :

a. Impression material - 20 hours
Manipulation and making impression and identifying setting time and defects.
(Comparative studies included)
b. Gypsum products - 20 hours

Recommended Text Books

Name of the Book & Title	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.	Price
Science of Dental Materials	Kennet. J. Anusavice	11th	2007	W.B. Sunder's Company, USA	$35.00
Notes on Dental Materials	E.C. Combe	06th	1992	Churchill Livingstone, UK	4.95 pounds
Applied Dental Material	John. F. Mc. Cabe	07th	1992	Oxford Blackwell Scientific pub. London	Rs. 320/-
Text Book of Dental Material	Craig. O. Brien	06th	1996	Mosby, USA	$ 15.00
Restorative Dental Materials	Craig.	11th	2002	Mosby, USA	Rs. 675/-

II Year - BDS
DENTAL MATERIAL

	Theory - 60 Hrs. Practical - 200 Hrs.	
1.	Chemistry of synthetic resins used in dentistry.	02
2.	Dental porcelains - types, composition, role played by each ingredient, manipulation, advantages and disadvantages, aluminous, porcelain, castable porcelain, metal fused porcelain, and porcelain repair materials.	05
3.	Tooth restorative materials - Classification and ideal properties : b. Cavity bases, liners and varnishes. c. Restorative resins - Brief history of resins as tooth restorative materials, filled resins (composite resins) - classification, chemistry of setting, composition, properties, uses, manipulation advantages and disadvantages, acid etching, bonding agents (Enamel and dentin bonding systems), Pit and fissure sealants.	12
4.	Direct filling Gold - types, advantages, disadvantages, brief study of manipulation (cold welding).	03
5.	Silver amalgam alloy - Brief history, classification, composition, role played by each ingredient, setting reaction, properties, manipulation and uses, comparative study of all types of silver amalgams Mercury Hygiene and Toxicity	04
6.	Casting gold alloys - Classification, corrosion, contents and role played by each ingredient, indications, white gold, uses.	03
7.	Dental casting investments - (Refractory materials) Classification, composition, setting reaction, manipulation and technical consideration.	03
8.	Casting procedures and casting defects, in general	04
9.	Base metal casting alloys - properties, composition and uses of Co-Cr, St. steel.	04
10.	Materials used in orthodontia - Luting cements, direct bonding agents, St. Steel, properties and gauzes of wires of gold, st. steel, Co-Cr and titanium alloys, brackets, sensitization.	06
11.	Abrasives and polishing agents - a. Clinical b. Laboratory.	04

Sl. No.	Theory - 20 Hrs. Practical - 40 Hrs.	Total 60 Hrs.
12.	Dental implant materials - History, biological properties and different designs.	02
13.	Miscellaneous - a. Infection control b. Artificial tooth material. c. Separating media d. Die spacers e. Tray adhesives f. Petroleum jelly g. Articulating paper h. Pressure indicating paste i. Endodontic materials j. Comparative studies between metallic and nonmetallic denture base. k. Bioglass l. Sprues m. Setting expansion, hygroscopic expansion, thermal expansion n. Dentifrices.	08

Practical Exercises : 200 Hours

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

II Exercises to be done by each student:

a. Manipulation and pouring impressions - 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.

d. Silver Amalgam - manipulation, trituaration.

Scheme of Examination
A. Theory : 70 Marks

Distribution of Topics and Type of Questions :

Contents	Type of Questions and Marks	Marks
Conservative Dentistry Topics	Long Essays 1 x 10 marks	10
Prosthodontics topics	Long Essays 1 x 10 marks	10
Conservative and Prosthetic topics (Four questions from each subject)	Short Essays 8 x 5 marks	40
Orthodontia*	Short Essays 2 x 2 marks	04
Conservative and Prosthetics topics* (Five questions from each subject)	Short Answers 3 x 2 marks	06
	Total	**70**

B. Viva Voce : 20 Marks

C. Internal Assessment - Theory : 10 marks, Practicals : 10 marks

D. Practicals : 90 Marks

1. Spotters: Identify and write the composition and two important uses:
Spotters - 25 Nos.
Marks - 01 Each
Time - 02 Minutes each - 25 Marks

2. Exercise No. 1 - 20 Marks
Any one exercise of the following:
a. Manipulation of impression compound and preparation of a plaster cast of U/L arch.
b. Manipulation of alginate impression material and preparation of plaster cast of U/L arch.
c. Manipulation of Zinc Oxide Eugenol impression paste, and preparation of cast of U/L arch.
d. Manipulation of Rubber Base impression material and preparation of Stone cast

3. Exercise No. 2 - 20 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 Ionomer Cement Type I/II (Luting/Filling consistency)

d. Polycarboxylate Cement (Luting consistency).

(Cements which are mixed for filling consistency should be filled in the cavity prepared in the extracted natural looth / typhodont.)

4. Exercise No. 3 - 25 marks

a. Trituration of Silver Amalgam and Condensation into the cavity prepared in extracted natural tooth/typhodont.
b. Mixing to heat cure Acrylic resin and recording of time taken for all stages.

Recommended Text Books

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Science of Dental Materials	Kennet. J. Anusavice	11th	2008	W.B. Sunder's Company, USA	$ 35.00
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Restorative Dental Materials	Craig.	11th	2002	Mosby, USA	Rs. 675

II BDS
PRE-CLINICAL CONSERVATIVE DENTISTRY

Theory : 25 Hours

Sl. No.		
1.	Introduction to Conservative Dentistry.	1 hour
2.	Definition, Aim & Scope of Conservative Dentistry & Endodontics	
3.	Classification of Cavities.	1 hour
4.	Nomenclature.	
5.	Various chair side positions.	1 hour
6.	Tooth Numbering.	
7.	Restoration - Definition & Objectives	
8.	Instruments - Classification, Nomenclature, Design, Formula of hand cutting instruments, Care, Grasps and Rests.	4 hours
9.	Rotary Cutting instruments - Burs, Design & use. Various speeds in Cavity preparation.	2 hours
10.	Principles of cavity /Tooth preparation for :	5 hours
	a. Silver Amalgam	
	b. Cast gold inlay	
	c. Composite resins.	
	d. Glass Ionomer	
11.	Matrices, Retainers, Wedges.	2 hours
12.	Separators - different methods of separation.	2 hours
13.	Finishing & polishing of restorations.	1 hours
14.	Management of deep carious lesions - pulp capping and pulpotomy.	3 hours
15.	Access cavity and brief introduction of root canal instruments.	3 hours

PRACTICAL EXCERCISES - 200 Hours

Preparation of 1" cube in Plaster of paris - 6 Nos.
Preparation of geometric cavities in the above cubes.

Preparation of Tooth models in plaster and preparation of cavities and restoration with modeling wax.

a. Incisors - 4 Nos.
b. Pre-Molars - 2 Nos.
c. Molars - 8 Nos. 30 Hours

Preparation of Cavities on Typhodont and/or Extracted Natural Teeth

I. CAVITIES	PREPARATION	RESTORATION	
Class I	6 with 2 extensions	4	25 Hours
Class II	5 DO | Conventional	8	25 Hours
	5 MO |		
	5 Conservative		
	2 MOD (1 Upper molar)	4	15 Hours
	(1 Lower Molar)	1	15 Hours
	3		
Class III	3 on Anteriors	All	15 Hours
Class V	2 on Posteriors	All	15 Hours
		All	15 Hours

II. INLAY PREPARATION :

Class I	1	To prepare Wax patterns 15 Hours
Class II	2+1 MOD	To prepare wax patterns and one to be casted
Class V	1 (posterior)	

III. CUSPAL PREPARATION : (Demonstration)

IV. 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 Tooth)

V. Demonstration of Light cure composite and Glass Ionomer Restorations.

VI. Demonstration of Instrumentation and Obturation of root canal.

VII. Demonstration - Wax pattern, investing, casting, polishing and cementation of cast restoration.

NOTE: The II year student should complete the prescribed quota of work before appearing for final internal assessment for the subject. This should be certified by the Head of the department before the candidate takes up final internal assessment exam.

Scheme of Examination
A. University Practicals : 60 Marks

Practical Exercise No.1 : 10 Marks

Spotters : 10 Nos., Marks : 01 Each, Time : 02 Minutes Each

Spotters
a. Hand instruments used to prepare cavity and restoration
b. Identification of Root Canal Instruments

Practical Exercise No.2 : 50 Marks

Preparation of Class II Conventional Cavity for Silver Amalgam in Maxillary or Mandibular I or II Molar tooth (Typhodont/Natural Tooth)

Cavity preparation	45 Minutes	25 Marks
Lining and Matrix	15 Minutes	10 Marks
Filling and carving	30 Minutes	15 Marks

B. University Viva-Voce : **20 Marks**

C. Internal Assessment : **20 Marks**

Total : **100 Marks**

TEXT BOOKS RECOMMENDED :

Name of the Book & Title	Author	Edn	Yr. of Publ.	Publ.'s Name Place of Publ.	Price
The Art & Science of Operative Dentistry	Sturdevant	3rd	1997	Mosby, USA	$ 30.00
Principle & Practice of Operative Dentistry	Charbeneu	3rd	1989	Varghese Publication, Bombay	Rs. 315/-
Endodontic Practice	Grossman	--	1988	Varghese Publication, Bombay	Rs. 323/-

III BDS
CONSERVATIVE DENTISTRY AND ENDODONTICS

Minimum Working hours for each subject of study
(BDS course)

Year	Lecturer Hours	Clinical Hours	Total Hours
III year BDS:	30	70	100
IV year BDS:	80	300	380

III year

Sl.No	Subjects	Hours
1	**Nomenclature Of Dentition:** Tooth numbering systems A D A,Zsigmondy Palmer-and FDIsystems	1 hour
2	**Gnathological Concepts Of Restoration:** Physiology Of occlsion, normal occlusion,Ideal occlusion, Mandibular movements and occlusal analysis. Contours and contacts	2 hours
3	**Dental Cariers:** Aetiology,Classification.Clinical features,morphological features, Microscopic features,clinical diagnosis and sequel of dental caries	3 hours
4	**Preventive measures in restorative practice:** Plaque Control Pit and fissure sealants, dietary measure restorative Procedure and periodontal health	2 hours
5	**Armamentarium for cavity preparation-** Hand cutting instruments Terminology and classification Applications Designs, formula and sharpening of instruments. Rotary cutting instruments Dental bur Mechanism of cutting, Common design characteristics Diamond abrasive and other abrasive instruments Cutting mechanism Hazards and precautions	2 hours

6	**Isolation of operating field** Purpose and methods of isolation	2 hours
7	**Infection control** Routes of transmission of dental infection Personal barrier protection Control of infection from aerosol and spatter sterilization procedure for dental equipment and instruments monitoring sterilization disinfection of Operatory Dental water line contamination and biofilm Disposal of wastes	3 hours
8	**Patient assessment, examination, diagnosis, and treatment planning** **Patients and operator position**	3 hours 1 hour
9	**Principles of Cavity preparation-** Steps and nomenclature of Cavity preparation classification of cavities	1 hour
10	**Pain control in operative dentistry**	1 hour
11	**Matricing and tooth separation**	2 hours
12	**Amalgam Restoration-** Indication, contraindication Advantages, disadvantages Cavity preparation for class I,II..V Step wise procedure for cavity Preparation and restoration including modifies designs Bonded amalgams, failure and repair of amalgam restorations	5 hours
13	**Hypersensitivity of dentin** Theories of hypersensitivity management	1 hour

IV Year - BDS

CONSERVATIVE TOPICS - 80 hours

1. Casts restorations Indications, contraindications, advantages and disadvantages Materials used Class II cavity preparation for inlays Types of bevels in cast restoration Differences in tooth preparation for amalgam and cast restorations Fabrication of wax patterns	3 hours
2. Casting Die materials and preparation of dies Refractory materials Alloys used for casting Casting machines Casting procedure and defects cementation of restoration	2 hours
3. Temporisation or interim restoration Materials and procedure	1 hours
4. Esthetics in dentistry Introduction and scope 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 hours
5. Composite restorations Recent advances in posterior composite resins. Indications ,contraindications, advantages and disadvantages Clinical technique for posterior direct composite restorations Finishing and polishing of composite restoration Indirect posterior composite restoration	3 hours
6. Non carious destruction of tooth structure - Definition ,etiology ,diagnosis ,clinical features and management	2 hours
7. 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 hours
8. Direct Filling gold Rëstorátions : Introduction Types of direct filling gold, indications contraindications advantages disadvantages tooth preparation and restoration	1 hours

ENDODONTIC TOPICS - 28 hours

1. Emergency endodontic procedures	2 hours
2. Internal anatomy of pulp space Root canal anatomy of maxillary and mandibular teeth.Classification of canal configuration and variations in pulp space	2 hours
3. Access cavity preparation Objectives Principles Instruments used Sequential steps of access cavity preparation for individual tooth	2 hours
4. Preparation of root canal space . a. Determination of working length definition and methods of determining working length b. cleaning and shaping of root canals objectives principles instruments used techniques-hand and rotary	2 hours
5. Disinfection of root canal space a. irrigation Introduction Function of irrigants Methods and techniques of irrigation b. intracanal medicaments functions requirements types method of placement and limitations	2hours
6. Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of curved root canals.	2 hours
7. Obturation of the root canal system. a. Materials- Ideal root canal filling material, classification of materials b. Obturation techniques Classification and procedure	2 hours
8. Root canal sealers. Ideal properties classification.,functions Manipulation and application of root canal sealers	2 hours

9. Post endodontic restoration Principles of post endodontic Restorations Post and core-materials and procedure (in brief)	2hours
10. Smear layer and its importance in endodontics and conservative treatment	1 hour
11. Traumatised teeth Classification of fractured teeth. Management of fractured tooth.	2 hours
12. Endodontic surgeries indication contraindications, pre operative preparation. surgical instruments and techniques apicectomy, retrograde filling, post operative sequale, trephination, hemisection, radisectomy reimplantation (both intentional and accidental)	3 hours
13. Root resorption Etiology and management	1 hour
14. Use of specialized equipments like Lasers and microscopes in conservative dentistry and endodontics	1hour

CLINICAL EXERCISES

1. Case history recording, diagnosis and treatment planning.
2. Clinical examination and use of various diagnostic aids
3. Pit and fissure sealants -10
4. Pulp Capping-10
5. Glass ionomer restorations-10
6. Composite restorations in anterior teeth-10
7. Composite restorations in posterior teeth-10
8. CLASS I Amalgam restorations-10
9. CLASS II Amalgam restoration-10
10. Rootcanal treatment for Anterior teeth- 2

Demonstration:

1. Cast inlay restoration
2. Post core restoration
3. Molar endodontic treatment
4. Peri apical surgery
5. Esthetic restorative procedures

- Bleaching of teeth
- Veneers
- Diastema closures etc..

6. Tooth coloured inlays,onlays, crowns.

Scheme of Examination

A. Theory : 70 Marks
Distribution of Topic and Type of Questions

Contents	Type of questions and marks	Marks
One long essay from conservative topics One long essay from endodontics topics	Long essay- 10×2=20	20
Five questions from conservative topics including aesthetic dentistry Three questions from endodontics topics	Short essay 08× 5=40	40
Three questions from conservative topics including esthetic dentistry Two questions from endodontics topics	Short answer 5×2=10	10
	Total	70

B. VIVA VOICE= 20 MARKS
C. INTERNAL ASSESMENT -THEORY :10MARKS, PRACTICALS :10 MARKS
D. PRACTICAL EXERCISE:90 MARKS

1. Preparation of class 2 cavity for amalgam and restoration
   Or
2. Anterior composite restoration
   Or
3. Root canal treatment for anterior tooth up to selection of master cone

Details of marks distribution of the practical examinations

1. Class II amalgam restoration

a. Case history recording, examination, diagnosis and treatment planning	- 15marks
b. Cavity preparation	- 30 marks
c. Lining and matrix	- 15 marks
d. Restoration and finishing	- 30 marks
Total	- 90 marks

2. Anterior composite restoration

a. Case history recording, examination, diagnosis and treatment planning	- 15marks
b. Tooth preparation, shade selection and isolation	- 35 marks
c. Restoration and finishing	- 40 marks
Total	- 90 marks

3. Anterior RCT

a. Case history recording, examination, diagnosis and treatment planning	- 20marks
b. Access cavity preparation	- 25marks
c. Working length	- 20 marks
d. Chemomechanical preparation and master cone selection	- 25marks
Total	- 90 marks