

(5)

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D.L.-33004/99



भारत का राजपत्र The Gazette of India

असाधारण

EXTRAORDINARY

भाग III — खण्ड 4

PART III—Section 4

प्राधिकार से प्रकाशित

PUBLISHED BY AUTHORITY

सं. 182]

No. 182]

नई दिल्ली, सोमवार, सितम्बर 10, 2007/भाद्र 19, 1929

NEW DELHI, MONDAY, SEPTEMBER 10, 2007/BHADRA 19, 1929

भारतीय दन्त परिषद्

अधिसूचना

नई दिल्ली, 25 जुलाई, 2007

सं. डी ई-22-2007.—दन्त अधिनियम, 1948 की धारा 20 द्वारा प्रदत्त शक्तियों का उपयोग करते हुए, केन्द्र सरकार की पूर्व संस्वीकृति के साथ भारतीय दन्त परिषद् द्वारा निम्नलिखित संशोधित बी डी एस पाठ्यक्रम विनियम बनाए गए हैं :—

लघु शीर्ष और प्रारम्भ.—(i) इन विनियमों को भारतीय दन्त परिषद् संशोधित बी डी एस पाठ्यक्रम विनियम, 2007 कहा जा सकता है।

(ii) ये सरकारी राजपत्र में उनके प्रकाशन की तारीख से प्रभावी होंगे।

दन्त शल्य चिकित्सा स्नातक की डिग्री के विनियम, 2007

(संशोधित 25-7-2007)

सामान्य : दन्त शल्य चिकित्सा स्नातक (बी.डी.एस.) तथा स्नातकोत्तर दन्त शल्य चिकित्सा (एम.डी.एस.) में डिग्री प्रदान करने वाले विश्वविद्यालय स्वतन्त्र दन्त चिकित्सा संकाय स्थापित करेंगे।

दाखिला चयन तथा स्थानान्तरण :—

I. दन्त चिकित्सा पाठ्यक्रम में प्रवेश - पात्रता मानदण्ड

किसी अभ्यर्थी को दन्त चिकित्सा पाठ्यक्रम (बी डी एस) में तब तक प्रवेश अनुमत नहीं किया जाएगा जब तक :—

1. वह बी डी एस पाठ्यक्रम के दाखिला के वर्ष के 31 दिसम्बर को या उससे पूर्व 17 वर्ष की आयु पूरी नहीं करेगा,

DENTAL COUNCIL OF INDIA

NOTIFICATION

New Delhi, the 25th July, 2007

No. DE-22-2007. — In exercise of the powers conferred by Section 20 of the Dentists Act, 1948, the Dental Council of India with the previous sanction of the Central Government hereby makes the following Revised BDS Course Regulations :—

1. Short title and commencement. — (i) These Regulations may be called the Dental Council of India Revised BDS Course Regulations, 2007.

(ii) They shall come into force on the date of their publication in the Official Gazette.

REGULATIONS FOR THE DEGREE OF BACHELOR OF DENTAL SURGERY, 2007

(Modified : 25-7-2007)

General : Universities awarding the degrees in Bachelor of Dental Surgery (BDS) and Master of Dental Surgery (MDS) shall establish independent Dental Faculty.

ADMISSION, SELECTION AND MIGRATION

I. Admission to the Dental Course—Eligibility Criteria :

No. Candidate shall be allowed to be admitted to the Dental Curriculum of first Bachelor of Dental Surgery (BDS) Course untill :

1. He/she shall complete the age of 17 years on or before 31st December, of the year of admission to the BDS course;
2. He/she has passed qualifying examination as under:-
 - a. The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of Physics, Chemistry, Biology and Mathematics or any

other elective subjects with English at a level not less than the core course for English as prescribed by the National Council for Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education;

Note: Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the dental colleges;

- b. The intermediate examination in science of an Indian University/Board or other recognised examining body with Physics, Chemistry and Biology which shall include a practical test in these subjects and also English as a compulsory subject;
- or
- c. The pre-professional/pre-medical examination with Physics, Chemistry and Biology, after passing either the higher secondary school examination, or the pre-university or an equivalent examination. The pre-professional/pre-medical examination shall include a practical test in Physics, Chemistry and Biology and also English as a compulsory subject;
- or
- d. The first year of the three years degree course of a recognised university, with Physics, Chemistry and Biology including a practical test in three subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level not less than a core course;
- or
- e. B.Sc examination of an Indian University, provided that he/she has passed the B.Sc examination with not less than two of the following subjects Physics, Chemistry, Biology (Botany, Zoology) and further that he/she has passed the earlier qualifying examination with the following subjects-Physics, Chemistry, Biology and English.
- or
- f. Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology including practical test in each of these subjects and English.

Note:

- Marks obtained in Mathematics are not to be considered for admission to BDS Course.
- After the 10+2 course is introduced, the integrated courses should be abolished.

II. Selection of Students: The selection of students to dental college shall be based solely on merit of the candidate and for-determination of the merit, the following criteria be adopted uniformly throughout the country:

1. In states, having only one Dental College and one university board/examining body conducting the qualifying examination, the marks obtained at such qualifying examination may be taken into consideration;
2. In states, having more than one university/board/examining body conducting the qualifying examination (or where there is more than one dental college under the administrative control of one authority) a competitive entrance examination should be held so as to achieve a uniform evaluation as there may be variation of standards at qualifying examinations conducted by different agencies;
3. Where there are more than one college in a state and only one university/board conducting the qualifying examination, then a joint selection board be constituted for all the colleges;
4. A competitive entrance examination is absolutely necessary in the cases of institutions of All India character;
5. Procedure for selection to BDS course shall be as follows:-
 - i. in case of admission on the basis of qualifying examination under clause (1) based on merit, candidate for admission to BDS course must have passed in the subjects of Physics, Chemistry, Biology & English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry, and Biology at the qualifying examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward Classes, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination be 40% instead of 50% as above and must have qualifying marks in English.
 - ii. In case of admission on the basis of competitive entrance examination under clause (2) to (4) of this regulation, a candidate must have passed in the subjects of Physics, Chemistry, Biology and English individually and

must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology at the qualifying examination and in addition must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks in Physics, Chemistry and Biology taken together in the competitive examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or any other categories notified by the Government the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as stated above:

Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he may be provisionally permitted to take up the competitive entrance examination and in case of selection for admission to the BDS course, he shall not be admitted to that course until he fulfils the eligibility criteria as per above regulations.

III. Duration of the Course:

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

IV. Migration:

- (1) Migration from one dental college to other is not a right of a student. However, migration of students from one dental college to another dental college in India may be considered by the Dental Council of India. Only in exceptional cases on extreme compassionate ground*, provided following criteria are fulfilled. Routine migrations on other ground shall not be allowed.
- (2) Both the colleges, i.e. one at which the student is studying at present and one to which migration is sought, are recognised by the Dental Council of India.
- (3) The applicant candidate should have passed first professional BDS examination.
- (4) The applicant candidate submits his application for migration, complete in all respects, to all authorities concerned within a period of one month of passing (declaration of results) the first professional Bachelor of Dental Surgery (BDS) examination.
- (5) The applicant candidate must submit an affidavit stating that he/she will pursue 240 days of prescribed study before appearing at IInd professional Bachelor of Dental Surgery (BDS) examination at the transferee dental college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

Note 1:

- (i) Migration is permitted only in the beginning of IInd year BDS Course in recognized Institution.
- (ii) All applications for migration shall be referred to Dental Council of India by college authorities. No Institution/University shall allow migrations directly without the prior approval of the Council.
- (iii) Council reserved the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decisions where applicant has been allowed to migrate without referring the same to the Council.

Note 2: *Compassionate ground criteria:

- (i) Death of supporting guardian.
- (ii) Disturbed conditions as declared by Government in the Dental College area.

V. Attendance requirement, Progress and Conduct

- (i) 75% in theory and 75% in practical/clinical in each year.
- (ii) In case of a subject in which there is no examination at the end of the academic year/semester, the percentage of attendance shall not be less than 70%. However, at the time of appearing for the professional examination in the subject, the aggregate percentage of attendance in the subject should satisfy condition (i) above.

VI. Subjects of Study:

First Year

- i) General Human Anatomy including Embryology and Histology

- ii) General Human Physiology and Biochemistry, Nutrition and Dietics
- iii) Dental Anatomy, Embryology and Oral Histology
- iv) Dental Materials
- v) Pre-clinical Prosthodontics and Crown & Bridge

Second Year

- i) General Pathology and Microbiology
- ii) General and Dental Pharmacology and Therapeutics
- iii) Dental Materials
- iv) Pre clinical Conservative Dentistry
- v) Pre clinical Prosthodontics and Crown & Bridge
- vi) Oral Pathology & Oral Microbiology

Third Year

- i) General Medicine
- ii) General Surgery
- iii) Oral Pathology and Oral Microbiology
- iv) Conservative Dentistry and Endodontics
- v) Oral & Maxillofacial Surgery
- vi) Oral Medicine and Radiology
- vii) Orthodontics & Dentofacial Orthopaedics
- viii) Paediatric & Preventive Dentistry
- ix) Periodontology
- x) Prosthodontics and Crown & Bridge

Fourth Year

- i) Orthodontics & dentofacial orthopaedics
- ii) Oral Medicine & Radiology
- iii) Paediatric & Preventive Dentistry
- iv) Periodontology
- v) Oral & Maxillofacial Surgery
- vi) Prosthodontics and Crown & Bridge
- vii) Conservative Dentistry and Endodontics
- viii) Public Health Dentistry

Fifth Year

- i) Oral & Maxillofacial Surgery
- ii) Prosthodontics and Crown & Bridge
- iii) Conservative Dentistry and Endodontics
- iv) Public Health Dentistry

EXAMINATIONS

SCOPE: These regulations shall be applicable for the B.D.S. degree examinations conducted by various universities in the country.

I. PREFACE:

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

(B) Evaluation is achieved by two processes

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

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

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

II. METHODS OF EVALUATION:

Evaluation may be achieved by the following tested methods:

1. Written test
2. Practicals

3. Clinical examination
4. Viva voce

INTERNAL ASSESSMENT EXAMINATION

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

SCHEME OF EXAMINATION:

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

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

- (1) Universities shall organize admission timings and admission process in such a way that teaching starts from 1st day of August in each academic year.

I B.D.S. Examination:

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

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

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

II B.D.S. Examination:

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

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

III B.D.S. Examination:

A candidate who has successfully completed the 2nd B.D.S. examination can appear 1st B.D.S. Examination.

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

IV B.D.S. Examination:

1. Oral Medicine and radiology
2. Paediatric & Preventive Dentistry
3. Orthodontics & dentofacial orthopaedics
4. Periodontology

V BDS Examination:

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

WRITTEN EXAMINATION:

1. The written examination in each subject shall consist of one paper of three hours duration and shall have maximum marks of 70.
2. In the subjects of Physiology & Biochemistry and Pathology & Microbiology each paper will be divided into two parts, A and B of equal marks.
3. The question paper should contain different types of questions like essay, short answer and objective type / M.C.Q's.

4. The nature of questions set, should be aimed to evaluate students of different standards ranging from average to excellent.
5. The questions should cover as broad an area of the content of the course. The essay questions should be properly structured and the marks specifically allotted.
6. The University may set up a question bank

PRACTICAL AND CLINICAL EXAMINATION:

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

MARKS DISTRIBUTION IN EACH SUBJECT :

Each subject shall have a maximum of 200 marks.

Theory	100
Practical/ Clinical	100

Theory - 100

University written exam	70
Viva Voce	20
Internal assessment (Written)	10
Total	100

Practicals/ clinicals - 100

University Exam	90
Internal assessment (Written)	10
Total	100

Practical and Viva Voce Only in University Examination:

Pre-clinical Prosthodontics	
Pre-clinical Conservative Dentistry.....	
Internal Assessment	20
Practical	60
Viva Voce	20
Total	100

Criteria for a pass:

Fifty percent of the total marks in any subject computed as aggregate for theory, i.e., written, viva voce and internal assessment and practicals including internal assessment, separately is essential for a pass in all years of study.

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

- > A candidate shall secure 50% marks in aggregate in University theory including Viva Voce and Internal assessment obtained in University written examination combined together.
- > In the University Practical/ clinical examination, a candidate shall secure 50% of University practical marks and Internal Assessment combined together.
- > In case of pre clinical Prosthetic Dentistry and Pre clinical conservative dentistry in II BDS, where there is no written examination, minimum for pass is 50% of marks in Practical and Viva voce combined together in University examination including Internal Assessment i.e. 50/100 marks.
- > Successful candidates who obtain 65% of the total marks or more shall be declared to have passed the examination in First Class. Other successful candidates will be placed in Second Class. A candidate who obtains 75% and above is eligible for Distinction. Only those candidates who pass the whole examination in the first attempt will be eligible for distinction or class.
- > First Class and Distinction etc. to be awarded by the University as per their respective rules.

Grace Marks: Grace marks upto a maximum of 5 marks may be awarded to students who have failed only in one subject but passed in all other subjects.

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

1. **Re-totalling:** The University on application and remittance of a stipulated fee to be prescribed by the university, shall permit a recounting or opportunity to recount the marks received for various questions in an answer paper/ papers for theory of all subjects for which the candidate has appeared in the university examination. Any error in addition of the marks awarded if identified should be suitably rectified.
2. **Re-evaluation:** Re-evaluation of theory papers in all years of study of the BDS course may be permissible by the university on application and remittance of a prescribed fee. Such answer script shall be re-evaluated by not less than two duly qualified examiners and the average obtained shall be awarded to the candidate and the result accordingly reconsidered. However in those universities where double evaluation provision exists, this provision of re-evaluation will not be applicable.

Qualification and experience to be eligible for examinership for BDS examination

1. M.D.S. Degree from a recognized Institution
2. 4 years teaching experience in the subject in a dental college after MDS
3. Should be holding the post of a Reader or above in a Dental Institution approved/recognised by the Dental Council of India for B.D.S.

Note:

1. In case of Public Health Dentistry, as there is acute shortage of teachers one examiner from Public Health Dentistry and the second one could be from Periodontics. To be reviewed after three years.
2. In case of Physiology and Biochemistry if Internal examiner is from Physiology, External examiner should be from Biochemistry or vice versa
3. In case of Pathology and Microbiology if Internal is examiner is from Pathology, External examiner should be from Microbiology or vice versa
4. In case of Dental Materials, if internal is from Prosthodontics, external should be from Conservative Dentistry and vice versa

50% of Examiners appointed shall be external from Dental Institutions approved/recognised by the Dental Council of India for B.D.S. Course, from other University, preferably from outside the State.

Reciprocal arrangement of Examiners should be discouraged, in that, the Internal Examiner in a subject should not accept external examinership for a College from which External Examiner is appointed in his subject for the corresponding period.

No person shall be an external Examiner to the same University for more than 3

consecutive years. However, if there is a break of one year the person can be re-appointed.

"Minimum Physical Requirement and Minimum Staffing Pattern (as per DCI Regulations 2006)."

GOALS AND OBJECTIVES

GOALS:

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 the 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.

OBJECTIVES:

The objectives are dealt under three headings (a) Knowledge and understanding (b) skills and (c) Attitudes.

(A) KNOWLEDGE AND UNDERSTANDING:

The graduate should acquire the following during the period of training.

1. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and be able to evaluate and analyse scientifically various established facts and data.
2. 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.
3. 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.
4. Adequate clinical experience required for general dental practice.
5. Adequate knowledge of the constitution, biological function 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) SKILLS:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry.

1. Able to diagnose and manage 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.
2. Acquire the skill to prevent and manage complications if encountered while carrying out various surgical and other procedures.
3. Possess skill to carry out certain investigative procedures and ability to interpret laboratory findings.
4. Promote oral health and help prevent oral diseases where possible.
5. Competent in the control of pain and anxiety among the patients during dental treatment.

(C) ATTITUDES:

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

1. Willing to apply the current knowledge of dentistry in the best interest of the patients and the community.
2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
3. Seek to improve awareness and provide possible solutions for oral health problems and needs through out the community.
4. Willingness to participate in the CPED Programmes to update the knowledge and professional skill from time to time.
5. To help and participate in the implementation of the national oral health policy.

RECOMMENDATIONS

GENERAL:

1. The undergraduate course involves organisation of teaching programmes year-wise. However, this course, as a whole, should demonstrate integration of the basic sciences, clinical dentistry and practical or the laboratory skills. The course should be designed and integrated in such a way to permit smooth progression from pre-clinical to clinical phase. Collaboration should be encouraged between teachers of basic sciences, dental sciences and clinical subjects.

2. The undergraduate dental course consists of three main components. The first component consists subjects common to medicine and dentistry like anatomy, physiology, biochemistry and behavioural science, leading to pharmacology, pathology, microbiology and then on to general medicine and general surgery. The second component runs concurrently with the first and deals with special aspects of oral and dental tissues, oral biology and oral pathology. Finally, the third component based on the foundations of the first two, deals with the clinical and technical aspects of dentistry as is required for general dental practice.
3. The first component of the course is intended to provide initially, an appreciation of normal human structure, development, function and behaviour, leading to understanding of the diseases, its prevention and treatment. The main objective is to provide the student a broad knowledge of the normal structures and functions of the body, the alterations which take place in disease with particular reference to those conditions in which medical and dental co-operation is essential for proper management. At this stage, the student should also be made aware of the social and psychological aspects of patient care with special reference to the relationship between dentist and patient. The behavioural sciences including both sociology and psychology should be introduced at the initial stages of the training programme, much before the students actually deal with the patients.
4. The second component of dental undergraduate programme consists instruction in the subjects dealing with dental and oral aspects to ensure a detailed knowledge of the structure and function of the dental and oral tissues. This enables the student to diagnose, prevent and treat the dental and oral diseases and disorders which were not included in the first component. The subject of oral biology is to be introduced at this level to provide the students a comprehensive knowledge and application of oral physiology, microbiology, biochemistry and oral immunology. Students should be exposed to the basic aspects of forensic odontology at this stage of the course along with oral biology/oral pathology.
5. The third component of the course comprising the clinical and technical aspects of dentistry actually prepares the student to undertake total oral and dental health care of the patients of all ages. The emphasis at this stage should be on the prevention of the various dental diseases and how to preserve natural teeth with their supporting structures. The importance of the various preventive methods need to be stressed. The significance of diagnosis of various dental and oral problems needs to be emphasized along with treatment planning before actual treatment procedures are undertaken.

In addition to acquiring the knowledge, the students need to gain adequate clinical hands-on-experience in extractions and other minor oral surgical procedures, all aspects of conservative dentistry, endodontics, crown and bridge, provision of partial and complete dentures, various periodontal therapeutic procedures and use of removable orthodontic appliances. Familiarity with various radiological techniques, particularly intra-oral methods and proper interpretation of the radiographs, is an essential part of this component of training and has application in clinical diagnosis, forensic identification and age estimation.

Towards the final stage of the clinical training, each student should be involved in comprehensive oral health care or holistic approach to enable them to plan and treat patients as a whole, instead of piece-meal treatment provided in each speciality. The Dental Council of India strongly recommends that all the dental colleges should provide facilities and required infrastructure for this purpose.

The aim of the undergraduate programme should undoubtedly be to produce a graduate, competent in general dental practice.

6. The commitment towards the society as a whole, needs to be stressed along with the knowledge and treatment skills gained. Instruction in public health dentistry should emphasise the sociological aspects of health care particularly, oral health care, including the reasons for the variation in oral and dental needs of different sections of the society. It is important to know the influence of the social, behavioural, environmental and economic factors on oral and dental health. Students should be made aware of the National oral health Policy and the importance of being a member of the Health care team delivering medical and oral health care particularly among rural population.
7. Scientific advancement of any profession is based largely on continuous research activities. Dentistry is no exception. It is important that in every dental college proper facilities should be provided for research and the faculty members should involve

- themselves in such activities. Inter-disciplinary research should be encouraged to bring in integration among various specialities. The teaching and training methodology should be such that the students are motivated to think and indulge in self study rather than playing a passive role. Provision should be made in the daily schedules for adequate time for reading. Proper library facilities with adequate timings and seating capacity should be made available in all dental colleges. Adequate audio visual aids, like video tapes, computer assisted learning aids, Medline and internet facilities should be provided in all dental colleges to encourage self-study. Students should be encouraged to participate in simple research project work and the system of electives, spending some stipulated amount of time in another dental college within the country or outside should be given a serious consideration by all the dental institutions.
8. The society has a right to expect high standards and quality of treatment. Hence, it is mandatory and a social obligation for each dental surgeon to upgrade his or her knowledge and professional skills from time to time. The Dental Council of India strongly recommends that facilities and proper infrastructure should be developed to conduct the continuous professional education programmes in dentistry to enable the practitioners to update their knowledge and skills. The Council is of the opinion that the dental colleges by virtue of their infrastructural facilities will be ideal to conduct such courses and recommends establishment of a Department of continuing dental education in each of the dental colleges. In addition, the practitioners should be encouraged to attend conferences of state and national level, workshops, seminars and any other such activity which the Council feels is suitable to upgrade the knowledge and skills.
 9. The undergraduate curriculum should stress the significance of infection and cross-infection control in dental practice. Aspects like sources of infection, measures to be adopted both general and specific for control particularly the HIV and hepatitis should be properly incorporated into the curriculum so that the graduates are aware of its significance and follow it in their practice.
 10. The information technology has touched every aspect of an individual's personal and professional life. The Council hence recommends that all undergraduates acquire minimum computer proficiency which will enable them to enhance their professional knowledge and skills.

RECOMMENDATIONS

SPECIFIC:

1. The undergraduate dental training programme leading to B.D.S. degree shall be a minimum of five years duration. During this period, the students shall be required to engage in full time study at a dental college recognized or approved by the Dental Council of India.
During the five years undergraduate course, the instruction in clinical subjects should be at least for three years
2. **Basic Medical & Dental Subjects:**
The basic medical and dental sciences comprise anatomy gross and microscopic, physiology, biochemistry, pharmacology, oral biology and science of dental materials. Subjects like behavioural sciences, which is useful to develop communication skills, should also be introduced in the first year itself and spread over the undergraduate course. An introduction to Public Health Dentistry & Preventive Dentistry also will be useful to develop the concept of commitment to community. The laboratory skills to be developed by the students like pre-clinical Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology exercises and studying dental morphology also is a part of initial training. The instruction in the above medical and dental sciences shall be for two years duration. At the end of this period the student should be in a position to understand and comprehend in general the development, structure and function of the human body in both health and disease.
3. The instruction in basic dental sciences should include theoretical and practical aspects of oral anatomy and physiology, to provide a detailed knowledge of the form and structure of teeth associated tissues and occlusal relationships.
The study should also aim at development of a concept regarding physiological and biochemical processes relevant to oral cavity for better understanding of the changes which occur with the onset of disease in the oral cavity.

The student should be made aware of the importance of various dental tissues in forensic investigation.

4. Clinical, Medical and Dental subjects:

The students should be introduced to clinics in the initial stage, preferably in the first year, as an observer to familiarise with clinical set-up and working. The period of instruction in the clinical subjects shall be not less than three years full time. During this, the student shall attend a dental hospital, general hospital, community camps and satellite clinics, in order to obtain instruction and experience in the practice of dentistry. The main objective of training in clinical dental subjects is to produce a graduate able and competent to recognize or diagnose various dental and oral diseases, to undertake general dental treatment, advise on the provision of specialized treatment available and finally advise the patient on prevention. The student should also understand the relationship between oral and systemic diseases.

5. The general medicine and surgery training should provide sufficient knowledge on human disease to enable the student to understand its manifestations as relevant to the practice of dentistry. This requires clinical teaching on patients and shall be carried out in in-patient and outpatient medical departments and specialist clinics.

This clinical instruction should enable the student to understand and perhaps diagnose common systemic diseases which have relevance to dental practice, by adopting a systematic approach of history taking and clinical examination. The student should also realize the significance of various general and special investigations in the diagnosis of diseases. The ability to recognize physical and mental illness, dealing with emergencies, effective communication with patients, interaction with various professional colleges also become important aspects of this training.

6. The Dental Council of India considers it important for all dental students to receive instruction in first-aid and principles of cardio-pulmonary resuscitation. It is also desirable that the student spend time in an accident and emergency department of a general hospital.

7. The purpose of the clinical training is to provide sufficient practical skill in all aspects of clinical dentistry. The instruction should also include patient management skills, treatment of patients of all ages with special reference to children (paediatric), very elderly (geriatric), medically compromised and disabled patients.

8. During the three years clinical course, the students should receive thorough instruction which involves history taking, diagnosis and treatment planning in all aspects of dentistry and should be competent on graduation to carry out all routine general procedures.

In Oral & Maxillofacial Surgery and Oral Implantology, instruction should include the knowledge of various maxillofacial problems like injuries, infections and deformities of the jaws and associated structures. The clinical experience should include those procedures commonly undertaken in general practice like extraction of teeth, minor oral surgical procedure etc.

In Conservative, Endodontics & Aesthetic Dentistry, Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology and Periodontology and Oral Implantology students should be competent on graduation to carry out routine treatment like restorations of various kinds, endodontic procedures, removable and fixed prosthodontics, concept of osseointegration and finally various kinds of periodontal therapy. In addition, students should be aware of their limitations on graduation, need to refer patients for consultant opinion and/or treatment and also the need for postgraduate and continuous education programmes.

In Orthodontics & Dento Facial Orthopedics, students should carry out simple appliance therapy for patients. Students should also be able to appreciate the role of dentofacial growth in the development and treatment of malocclusion.

In Paediatric dentistry, the students should concentrate on clinical management, efficacy of preventive measures, treatment needs particularly for children with disabilities. In oral medicine and oral diagnosis, the student should receive instruction in various lesions, occurring in the oral cavity with particular reference to oral cancer.

9. The successful control and management of pain is an integral part of dental practice. Upon graduation the students should be competent to administer all forms of local

anaesthesia. The value of behavioural methods of anxiety management should be emphasised. The students should also have the practical experience in the administration of intra-muscular and intra-venous injections. Knowledge of pain mechanisms and strategies to control post-operative pain is essential for practice of dentistry.

10. All students should receive instructions and gain practical experience in taking processing and interpretation of various types of intra and extra oral radiographs. They should be aware of the hazards of radiation and proper protective measures from radiation for the patient, operator and other staff.
11. Instruction should be given in dental jurisprudence, legal and ethical obligations of dental practitioners and the constitution and functions of Dental Council of India.
12. Infection and cross infection control assume significance in dental practice. The students should be made aware of the potential risk of transmission in the dental surgery, various infectious diseases particularly HIV and hepatitis. The students should be aware of their professional responsibility for the protection of the patients, themselves and their staff and the requirements of the health and safety regulations.
13. In the recent times, the subjects of esthetic dentistry, oral implantology, behavioural sciences and forensic odontology have assumed great significance. Hence, the Council recommends that these four specialities should be incorporated into the undergraduate curriculum. The instruction and clinical training in aesthetic dentistry shall be carried out by the departments of Conservative, Endodontics & Aesthetic Dentistry and prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology. Similarly, the instruction and clinical training in oral implantology shall be done by the departments of Oral & Maxillofacial Surgery, Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology and Periodontology and Oral Implantology. The instruction in behavioural sciences should ideally commence before the students come in contact with the patients and shall be carried out by the departments of Public Health Dentistry & Preventive Dentistry and Pedodontics & Preventive Dentistry. Forensic Odontology will be a part of Oral Pathology & Oral Microbiology and Oral Medicine and Radiology.

COMPETENCIES

At the completion of the undergraduate training programme the graduates shall be competent in the following:-

General Skills

- Apply knowledge & skills in day to day practice
- Apply principles of ethics
- Analyze the outcome of treatment
- Evaluate the scientific literature and information to decide the treatment
- Participate and involve in professional bodies
- Self assessment & willingness to update the knowledge & skills from time to time
- Involvement in simple research projects
- Minimum computer proficiency to enhance knowledge and skills
- Refer patients for consultation and specialized treatment
- Basic study of forensic odontology and geriatric dental problems

Practice Management

- Evaluate practice location, population dynamics & reimbursement mechanism
- Co-ordinate & supervise the activities of allied dental health personnel
- Maintain all records
- Implement & monitor infection control and environmental safety programs
- Practice within the scope of one's competence

Communication & Community Resources

- Assess patients goals, values and concerns to establish rapport and guide patient care
- Able to communicate freely, orally and in writing with all concerned
- Participate in improving the oral health of the individuals through community activities.

Patient Care - Diagnosis

- Obtaining patient's history in a methodical way
- Performing thorough clinical examination

Selection and interpretation of clinical, radiological and other diagnostic information
Obtaining appropriate consultation
Arriving at provisional, differential and final diagnosis

Patient Care - Treatment Planning

Integrate multiple disciplines into an individual comprehensive sequence treatment plan using diagnostic and prognostic information
Able to order appropriate investigations

Patient Care - Treatment

Recognition and initial management of medical emergencies that may occur during Dental treatment
Perform basic cardiac life support
Management of pain including post operative
Administration of all forms of local anaesthesia
Administration of intra muscular and venous injections
Prescription of drugs, pre operative, prophylactic and therapeutic requirements
Uncomplicated extraction of teeth
Transalveolar extractions and removal of simple impacted teeth
Minor oral surgical procedures
Management of Oro-facial infections
Simple orthodontic appliance therapy
Taking, processing and interpretation of various types of intra oral radiographs
Various kinds of restorative procedures using different materials available
Simple endodontic procedures
Removable and fixed prosthodontics
Various kinds of periodontal therapy

ORAL MEDICINE & RADIOLOGY

- Able to identify precancerous and cancerous lesions of the oral cavity and refer to the concerned speciality for their management
- Should have an adequate knowledge about common laboratory investigations and interpretation of their results.
- Should have adequate knowledge about medical complications that can arise while treating systemically compromised patients and take prior precautions/ consent from the concerned medical specialist.
- Have adequate knowledge about radiation health hazards, radiations safety and protection.
- Competent to take intra-oral radiographs and interpret the radiographic findings
- Gain adequate knowledge of various extra-oral radiographic procedures, TMJ radiography and sialography.
- Be aware of the importance of intra- and extra-oral radiographs in forensic identification and age estimation
- Should be familiar with jurisprudence, ethics and understand the significance of dental records with respect to law

PAEDIATRIC & PREVENTIVE DENTISTRY

- Able to instill a positive attitude and behaviour in children towards oral health and understand the principles of prevention and preventive dentistry right from birth to adolescence.
- Able to guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry.
- Able to treat dental diseases occurring in child patient.
- Able to manage the physically and mentally challenged disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS

- Understand about normal growth and development of facial skeleton and dentition.
- Pinpoint aberrations in growth process both dental and skeletal and plan necessary treatment
- Diagnose the various malocclusion categories
- Able to motivate and explain to the patient (and parent) about the necessity of treatment
- Plan and execute preventive orthodontics (space maintainers or space regainers)
- Plan and execute interceptive orthodontics (habit breaking appliances)
- Manage treatment of simple malocclusion such as anterior spacing using removable appliances

- Handle delivery and activation of removable orthodontic appliances
- Diagnose and appropriately refer patients with complex malocclusion to the specialist

PERIODONTOLOGY

- Diagnose the patients periodontal problem, plan and perform appropriate periodontal treatment
- Competent to educate and motivate the patient
- Competent to perform thorough oral prophylaxis, subgingival scaling, root planning and minor periodontal surgical procedures
- Give proper post treatment instructions and do periodic recall and evaluation
- Familiar with concepts of osseointegration and basic surgical aspects of implantology

PROSTHODONTICS AND CROWN & BRIDGE

- Able to understand and use various dental materials
- Competent to carry out treatment of conventional complete and partial removable dentures and fabricate fixed partial dentures
- Able to carry out treatment of routine prosthodontic procedures.
- Familiar with the concept of osseointegration and the value of implant-supported Prosthodontic procedures

CONSERVATIVE DENTISTRY AND ENDODONTICS

- Competent to diagnose all carious lesions
- Competent to perform Class I and Class II cavities and their restoration with amalgam
- Restore class V and Class III cavities with glass ionomer cement
- Able to diagnose and appropriately treat pulpally involved teeth (pulp capping procedures)
- Able to perform RCT for anterior teeth
- Competent to carry out small composite restorations
- Understand the principles of aesthetic dental procedures

ORAL & MAXILLOFACIAL SURGERY

- Able to apply the knowledge gained in the basic medical and clinical subjects in the management of patients with surgical problems
- Able to diagnose, manage and treat patients with basic oral surgical problems
- Have a broad knowledge of maxillofacial surgery and oral implantology
- Should be familiar with legal, ethical and moral issues pertaining to the patient care and communication skills
- Should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner
- Understand and practice the basic principles of asepsis and sterilisation
- Should be competent in the extraction of the teeth under both local and general anaesthesia
- Competent to carry out certain minor oral surgical procedure under LA like trans-alveolar extraction, frenectomy, dento alveolar procedures, simple impaction, biopsy, etc.
- Competent to assess, prevent and manage common complications that arise during and after minor oral surgery
- Able to provide primary care and manage medical emergencies in the dental office
- Familiar with the management of major oral surgical problems and principles involved in the in-patient management

PUBLIC HEALTH DENTISTRY

- Apply the principles of health promotion and disease prevention
- Have knowledge of the organization and provision of health care in community and in the hospital service
- Have knowledge of the prevalence of common dental conditions in India.
- Have knowledge of community based preventive measures
- Have knowledge of the social, cultural and env. Factors which contribute to health or illness.
- Administer and hygiene instructions, topical fluoride therapy and fissure sealing.
- Educate patients concerning the aetiology and prevention of oral disease and encourage them to assure responsibility for their oral health.

MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY
(B.D.S COURSE)

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including	100	175		275

Embryology, Osteology and Histology.				
General Human Physiology	120	60		180
Biochemistry	70	60		130
Dental Materials	80	240		320
Dental Anatomy Embryology, and Oral Histology	105	250		355
Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
Microbiology	65	50		115
General Medicine	60		9	150
General Surgery	60		90	150
Oral Pathology & Microbiology	145	130		275
Oral Medicine & Radiology	65		200	265
Paediatric & Preventive Dentistry	65		200	265
Orthodontics & dental orthopaedics	50		200	250
Periodontology	80		200	280
Oral & Maxillofacial Surgery	70		360	430
Conservative Dentistry & Endodontics	135	200	460	795
Prosthodontics & Crown & Bridge	135	300	460	895
Public Health Dentistry	60		290	350
Total	1590	1540	2550	5680

Note:

There should be a minimum of 240 teaching days every year consisting of 8 working hours including one hour of lunch break.

**MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY
(B.D.S COURSE)**

I B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology and Histology	100	175		275
General Human Physiology	120	60		180
Biochemistry	70	60		130
Dental Anatomy Embryology, and Oral Histology	105	250		355
Dental Materials	20	40		60
Pre clinical Prosthodontics & Crown & Bridge	-	100		100
Total	415	685		1100

II B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General & Dental Pharmacology and therapeutics	70	20		90
General Pathology	55	55		110
Microbiolog	65	50		115
Dental Materials	60	200		260
Oral Pathology and Oral Microbiology	25	50		75
Pre Clinical Prosthodontics & Crown & Bridge	25	200		225
Pre Clinical Conservative Dentistry	25	200		225
Total	325	775		1100

III B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Medicine	60		90	150
General Surgery	60		90	150

Oral Pathology and Oral Microbiology	120	80		200
Oral Medicine and Radiology	20		70	90
Paediatric and Preventive Dentistry	20		70	90
Orthodontics & Dentofacial Orthopaedics	20		70	90
Periodontology	30		70	100
Oral & Maxillofacial Surgery	20		70	90
Conservative Dentistry & Endodontics	30		70	100
Prosthodontics and Crown & Bridge	30		70	100
Total	410		750	1160

IV B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Oral Medicine and Radiology	45		130	175
Paediatric and Preventive Dentistry	45		130	175
Orthodontics & Dentofacial Orthopaedics	30		130	160
Periodontology	50		130	180
Oral & Maxillofacial Surgery	20		90	110
Conservative Dentistry & Endodontics	30		90	120
Prosthodontics and Crown & Bridge	30		90	120
Public Health Dentistry	30		90	120
Total	280		880	1160

V B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Oral & Maxillofacial Surgery	30		200	230
Conservative Dentistry & Endodontics	50		300	350
Prosthodontics and Crown & Bridge	50		300	350
Public Health Dentistry	30		200	230
Total	160		1000	1160

Note:

- * Behavioral Sciences Classes shall commence in 1st Year.
- * Forensic odontology shall be covered in the department of Oral pathology and Oral Medicine during 3rd Year.
- * Esthetic Dentistry shall be covered in the Departments of Conservative Dentistry and Prosthodontics during 4th & 5th Year.
- * Oral Implantology shall be covered in the Department of Maxillofacial Surgery, Prosthodontics & Crown & Bridge and Periodontology during 4th & 5th Years.
- * Ethics and dental jurisprudence shall be covered in Public Health Dentistry in 4th and 5th years.
- * Electives / Research work should be encouraged during the 5th Year lasting for a period of atleast one month to be spent in a different dental institution in India / overseas.
- * All the institutions shall compulsorily make arrangements for Comprehensive oral health care training for atleast 3 months during 5th Year. The department of Public Health Dentistry may be utilised in case, the institution does not have separate department for this purpose. Qualified faculty members from the departments of Prosthodontics, Conservative and periodontics should guide the students along with faculty of Public Health Dentistry Department.
- * The minimum working hours indicated each year of study does not include one month mid year vacation and one month of university examination.

RECOMMENDED BOOKS

1. **Human Anatomy, Embryology, Histology & Medical Genetics**
 1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown & company, Boston.
 2. RJ LAST'S Anatomy - McMinn, 9th edition.

3. ROMANES(G.J.) Cunningham Manual of Practical Anatomy : Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.
4. WHEATER,BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
5. SADLER , LANGMAN'S, Medical Embryology, Ed. 6.
6. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
7. WILLIAMS, Gray's Anatomy, Ed.38. ,Churchill Livingstone.
8. EMERY,Medical Genetics.

2. Physiology

1. Guyton; Text book of Physiology, 9th edition.
2. Ganong; Review of Medical Physiology, 19th edition
3. Vander; Human physiology, 5th edition
4. Choudhari; Concise Medical Physiology, 2nd edition
5. Chatterjee; Human Physiology, 10th edition
6. A.K. Jain; Human Physiology for BDS students, 1st edition
7. Berne & Levey; Physiology, 2nd edition
8. West-Best & Taylor's, Physiological basis of Medical Practise, 11th edition

EXPERIMENTAL PHYSIOLOGY:

1. Rannade; Practical Physiology, 4th edition
2. Ghai; a text book of practical physiology
3. Hutchison's; Clinical Methods, 20th edition

3. Biochemistry

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. Lecture notes in Biochemistry 1984, J.K. Kandlish

REFERENCE BOOKS:

1. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
2. Harper's Biochemistry, 1996., R.K. Murray et.al
- Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliott

4. Dental Anatomy, Embryology and Oral Histology

1. Orban's Oral Histology & Embryology - S.N. Bhaskar
2. Oral Development & Histology - James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major M. Ash
4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

5. General Pathology

1. Robbins - Pathologic Basis of Disease Cotran, Kumar, Robbins
2. Anderson's Pathology Vol 1 & 2 Editors - Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematolog Lee, Bithell, Foerster, Athens, Lukens

6. Microbiology

1. Text book of Microbiology - R.Ananthanarayan & C.K.Jayaram Paniker
2. Medical Microbiology - David Greenwood et al.
3. Microbiology - Prescott, et al.
4. Microbiology - Bernard D. Davis , et al.
5. Clinical & Pathogenic Microbiology - Barbara J Howard, et al.
6. Mechanisms of Microbial diseases - Moselio Schaechter, et al.
7. Immunology an Introduction - Tizard
8. Immunology 3rd edition - Evan Roitt , et al.

7. Dental Materials

1. Phillips Science of Dental Materials - 10th edn. - Kenneth J. Anusavice
2. Restorative Dental Materials - 10 edn. Robert G.Craig
3. Notes on Dental Materials - E.C. Combe
4. Prep. Manual for undergraduates - Dental Materials - Dr. M.S. Koudi & Dr. SanjayGouda
B. Patil

8. **General and dental pharmacology and therapeutics**
 1. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacotherapeutics, 10th Edition, Bombay Popular Prakashan 1991.
 2. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997
 3. Laurence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997
 4. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part II, 13th Popular Prakashan Bombay 1993
 5. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.
9. **General Medicine**
Textbook of Medicine Davidson
Textbook of Medicine Hutchinson
10. **General Surgery**
Short practice of Surgery Bailey & Love
11. **Oral Pathology & Oral Microbiology**
 1. A Text Book of Oral Pathology Shafer, Hine & Levy
 2. Oral Pathology - Clinical Pathologic correlations Regezi & Sciubba.
 3. Oral Pathology Soames & Southam.
 4. Oral Pathology in the Tropics Prabhu, Wilson, Johnson & Daftary
12. **Public Health Dentistry**
 1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. -1983, W. B. Saunders Company
 2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.
 3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981
 4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/ New York, 1981
 5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvira F. Gardner, PSG Publishing company Inc. Littleton Massachusetts, 1980.
 6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wright and sons Bristol, 1980
 7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.
 8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
 9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristol, 1980.
 10. Preventive Dentistry by Murray, 1997.
 11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.
 12. Community Dentistry by Dr. Soben Peter.
 13. Introduction to Bio-statistics by B. K. Mahajan
 14. Introduction to Statistical Methods by Grewal
13. **Paediatric and Preventive Dentistry**
 1. Pediatric Dentistry (Infancy through Adolescence) - Pinkham.
 2. Clinical Use of Fluorides - Stephen H. Wei.
 3. Understanding of Dental Caries - Niki Foruk.
 4. Handbook of Clinical Pedodontics - Kenneth. D.
 5. Dentistry for the Child and Adolescence - Mc. Donald.
 6. Pediatric Dentistry - Damle S. G.
 7. Behaviour Management - Wright
 8. Traumatic Injuries - Andreason.
 9. Textbook of Pedodontics - Dr. Shobha Tandon
14. **Oral Medicine and Radiology**
 - a) Oral Diagnosis, Oral Medicine & Oral Pathology
 1. Burkitt - Oral Medicine - J.B. Lippincott Company

2. Coleman - Principles of Oral Diagnosis - Mosby Year Book
3. Jones - Oral Manifestations of Systemic Diseases - W.B. Saunders company
4. Mitchell - Oral Diagnosis & Oral Medicine
5. Kerr - Oral Diagnosis
6. Miller - Oral Diagnosis & Treatment
7. Hutchinson - clinical Methods
8. Oral Pathology - Shafers
9. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine
- b) Oral Radiology
 1. White & Goaz - Oral Radiology - Mosby year Book
 2. Weahrman - Dental Radiology - C.V. Mosby Company
 3. Stafne - Oral Roentgenographic Diagnosis - W.B.Saunders Co.,
- c) Forensic Odontology
 1. Derek H.Clark - Practical Forensic Odontology - Butterworth-Heinemann (1992)
 2. C Michael Bowers, Gary Bell - Manual of Forensic Odontology - Forensic Pr (1995)
15. **Orthodontics and Dentofacial Orthopedics**
 1. Contemporary Orthodontics William R. Proffit
 2. Orthodontics For Dental Students White And Gardiner
 3. Handbook Of Orthodontics Moyers
 4. Orthodontics - Principles And Practice Graber
 5. Design, Construction And Use Of Removable Orthodontic Appliances C. Philip Adams
 6. Clinical Orthodontics: Vol1 & 2 Salzmann
16. **Oral and Maxillofacial Surgery**
 1. Impacted teeth; Alling John F & etal.
 2. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson:LJ & etal.
 3. Handbook of medical emergencies in the dental office, Malamed SF.
 4. Killeys Fractures of the mandible; Banks P.
 5. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
 6. Killey and Kays outline of oral surgery - Part-1; Seward GR & etal
 7. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
 8. Extraction of teeth;Howe, GL
 9. Minor Oral Surgery; Howe.GL
17. **Prosthodontics, Crown & Bridge**
 1. Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahr.
 2. Boucher's "Prosthodontic treatment for edentulous patients"
 3. Essentials of complete denture prosthodontics by - Sheldon Winkler.
 4. Maxillofacial prosthetics by - William R.Laney.
 5. McCracken's Removable partial prosthodontics
 6. Removable partial prosthodontics by - Ernest L. Miller and Joseph E. Grasso.
18. **Periodontology**
 1. Glickman's Clinical Periodontology - Carranza
- REFERENCE BOOKS :**
 1. Essentials of Periodontology and Periodontics - Torquil MacPhee
 2. Contemporary Periodontics - Cohen
 3. Periodontal therapy - Goldman
 4. Orbans' Periodontics - Orban
 5. Oral Health Survey - W.H.O.
 6. Preventive Periodontics - Young and Stiffler
 7. Public Health Dentistry - Slack
 8. Advanced Periodontal Disease - John Prichard
 9. Preventive Dentistry - Forrest
 10. Clinical Periodontology - Jan Lindhe
 11. Periodontics - Baer & Morris.
19. **Conservative Dentistry and Endodontics**
 1. Esthetic guidelines for restorative dentistry; Scharer & others
 2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
 3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

20. **Aesthetic Dentistry**
 1. Aesthetic guidelines for restorative dentistry; Schärer & others
 2. Aesthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
 3. Aesthetic & the treatment of facial form; Vol 28; Mc Namara (JA)
 21. **Forensic Odontology**
 1. Practical Forensic odontology – Derek Clark
 22. **Oral Implantology**
 1. Contemporary Implant Dentistry – Carl E. Misch Mosby 1993 First Edition.
 2. Osseointegration and Occlusal Rehabilitation Hobo S., Ichida E. and Garcia L.T. Quintessence Publishing Company, 1989 First Edition.
 23. **Behavioural Science**
 1. General psychology -- Hans Raj, Bhatia
 2. Behavioural Sciences in Medical practice -- Manju Mehta
 24. **Ethics**
 1. Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189.
- Note:** 1. Books titles will keep on adding in view of the latest advances in the Dental Sciences.
2. Standard Books from Indian Authors are also recommended.

LIST OF JOURNALS:

1. Journal of Dentistry
2. British Dental Journal
3. International Dental Journal
4. Dental Abstracts
5. Journal of American Dental Association
6. British Journal of Oral and Maxillofacial Surgery
7. Oral Surgery, Oral Pathology and Oral Medicine
8. Journal of Periodontology
9. Journal of Endodontics
10. American Journal of Orthodontics and Dentofacial Orthopedics
11. Journal of Prosthetic Dentistry
12. Journal of Public Health Dentistry
13. Endodontics and Dental Traumatology
14. Journal of Dental Education
15. Dental Update
16. Journal of Dental Material

Note: This is the minimum requirement. More journals both Indian and Foreign are recommended for imparting research oriented education.

INFRASTRUCTURE & FUNCTIONAL REQUIREMENTS 50 ADMISSIONS

General Facilities:

1. **Administrative block:** 2000 sq.ft.

consisting of –

- (a) Dean's room,
- (b) Administrative officer's room
- (c) Meeting room
- (d) Office
- (e) Office stores
- (f) Pantry etc.

2. **Library:** 4500 sq.ft.

consisting of –

- (a) Reception & waiting
- (b) Property counter
- (c) Issue counter

- (d) Photocopying area
 - (e) Reading room to accommodate 50% of total students strength.
 - (f) Postgraduates & staff reading room
 - (g) Journal room
 - (h) Audio-visual room
 - (i) Chief librarian room
 - (j) Stores and stocking area.
3. **Lecture halls - 4 :** 3200 sq.ft.
Each hall to accommodate 10% more of admission strength with proper seating arrangement, blackboard, microphone and facilities for slide, overhead and multi-media projection.
 4. **Central stores:** 400 sq.ft.
With proper storing facilities like racks, refrigerator, preferably compact storage systems.
 5. **Maintenance room:** 600 sq.ft.
Equipped with proper facilities to maintain and repair dental chairs and units and various other equipments in the college and hospital.
 6. **Photography and artist room:** 250 sq.ft.
With proper studio facilities for clinical photography, developing, preparation of slides, charts, models etc.
 7. **Medical stores:** 200 sq.ft.
Stocked with all the necessary drugs usually prescribed in a dental hospital.
 8. **Aminities area:** 2000 sq.ft.
 - (a) Boys' and Girls' locker rooms
 - (b) Boys' and Girls' common rooms
 - (c) Common room for non-teaching staff
 - (d) Common room for teaching staff
 - (e) Change room for men
 - (f) Change room for women
 9. **Compressor and room for gas plant:** 200 sq.ft.
Adequate to accommodate required capacity compressors, gas cylinders etc.
 10. **Pollution control measures:**
All the dental institutions shall take adequate pollution control measures by providing incineration plant, sewage water treatment plant, landscaping of the campus etc.
 11. **Cafeteria:** 800 sq.ft.
With accommodation for 100 people with kitchen, stores, washing area etc.
 12. **Examination hall:** 1800 sq.ft.
A separate hall for university and other examination furnished with chairs and individual tables to accommodate 125 students at a time.
 13. **Hostels:**
The hostel accommodation shall be provided based on number of admissions for all the boys and girls in the Dental College campus itself. The accommodation may be increased in a phased manner over a period of 4 years.
 14. **Staff quarters:**
All the staff members, teaching and non-teaching working in the institution shall be provided adequate accommodation in the 5 acres land earmarked for the college. The staff quarters may be built in a phased manner over a period of 4 years.
 15. **Play ground:**
There shall be facilities for both indoor and out-door games in the premises.
 17. **Auditorium:**
To accommodate at least 400 people consisting of -
Proper seating arrangements, reception counter, green rooms, lobby, fitted with sound system, slide and multimedia presentation facility.

18. Laboratories :

I. Dental subjects:

- (a) Pre-clinical Prosthodontics and dental material lab - 1500 sq.ft.
- (b) Pre-clinical conservative lab - 1300 sq.ft.
- (c) Oral biology and oral pathology lab - 1300 sq.ft.
- (d) Laboratory for orthodontics and pedodontics - 800 sq.ft.

II. Medical subjects: (only for independent dental colleges): 4500 sq.ft.

- (a) Anatomy dissection hall with storage for cadavers, osteology, demonstration room etc. Area-1500 sq.ft.
- (b) One laboratory for physiology and pathology and microbiology with stores and preparation rooms for individual subjects attached to it. Area-1500 sq.ft.
- (c) Laboratory for biochemistry and pharmacology with store and preparation rooms separately for both subjects. Area-1500 sq.ft.

III. Clinical:

- (a) Prosthodontics-Plaster room
Polymers room
Wax room
Casting laboratory
Ceramic lab 1300 sq.ft.
- (b) Conservative Dentistry - Plaster room
Casting & ceramic laboratories ... 300 sq.ft.
- (c) Oral pathology for histopathology ... 400 sq.ft.
- (d) Haematology and clinical biochemistry: a laboratory for routine blood and biochemical investigation and urine analysis ... 200 sq.ft.

16. Distilled Water Plant

100 ADMISSIONS

General:

- 1. **Administrative block:** 3000 sq.ft.
consisting of -

- (a) Dean's room,
- (b) Administrative officer's room
- (c) Meeting room
- (d) Office
- (e) Office stores
- (f) Pantry etc.

- 2. **Library:** 8000 sq.ft.

consisting of -

- (a) Reception & waitingProperty counter
- (b) Issue counter
- (c) Photocopying area
- (d) Reading room to accommodate 50% of total students strength.
- (e) Postgraduates & staff reading room
- (f) Journal room
- (g) Audio-visual room
- (h) Chief librarian room
- (i) Stores and stocking area.
- (j) E-Consortium provision to be provided in the College Library connected with the National Medical Library.

- 3. **Lecture halls - 4 :** 6400 sq.ft.

Each hall to accommodate 10% more of admission strength with proper seating arrangement, blackboard, microphone and facilities for slide, overhead and multi-media projection.

- 4. **Central stores:** 800 sq.ft.

With proper storing facilities like racks, refrigerator, preferably compact storage systems.

- 5. **Maintenance room:** 1000 sq.ft.

Equipped with proper facilities to maintain and repair dental chairs and units and various other equipments in the college and hospital.

- 6. **Photography and artist room:** 400 sq.ft.

With proper studio facilities for clinical photography, developing, preparation of slides, charts, models etc.

7. **Medical stores:** 300 sq.ft.
Stocked with all the necessary drugs usually prescribed in a dental hospital.
8. **Aminities area:** 3200 sq.ft.
 - (a) Boys' and Girls' locker rooms
 - (b) Boys' and Girls' common rooms
 - (c) Common room for non-teaching staff
 - (d) Common room for teaching staff
 - (e) Change room for men
 - (f) Change room for women
9. **Compressor and room for gas plant:** 300 sq.ft.
Adequate to accommodate required capacity compressors, gas cylinders etc.
10. **Pollution control measures:**
All the dental institutions shall take adequate pollution control measures by providing incineration plant, sewage water treatment plant, landscaping of the campus etc.
11. **Cafeteria:** 1500 sq.ft.
With accommodation for 100 people with kitchen, stores, washing area etc.
12. **Examination hall:** 3600 sq.ft.
A separate hall for university and other examination furnished with chairs and individual tables to accommodate 250 students at a time.
13. **Hostels:**
The hostel accommodation shall be provided based on number of admissions for all the boys and girls in the Dental College campus itself. The accommodation may be increased in a phased manner over a period of 4 years.
14. **Staff quarters:**
All the staff members, teaching and non-teaching working in the institution shall be provided adequate accommodation in the 5 acres land earmarked for the college. The staff quarters may be built in a phased manner over a period of 4 years.
15. **Play ground:**
There shall be facilities for both indoor and out-door games in the premises.
16. **Auditorium:**
To accommodate at least 500 people consisting of -
Proper seating arrangements, reception counter, green rooms, lobby, fitted with sound system, slide and multimedia presentation facility.
17. **Laboratories:**
 - I. Dental subjects:**
 - (a) Pre-clinical Prosthodontics and dental material lab - 3000 sq.ft.
 - (b) Pre-clinical conservative lab - 2500 sq.ft.
 - (c) Oral biology and oral pathology lab - 2500 sq.ft.
 - (d) Laboratory for orthodontics and pedodontics - 1500 sq.ft.
 - II. Medical subjects:** (only for independent dental colleges): 7500 sq.ft.
 - (a) Anatomy dissection hall with storage for cadavers, osteology, demonstration room etc. Area - 2500 sq.ft.
 - (b) One laboratory for physiology and pathology and microbiology with stores and preparation rooms for individual subjects attached to it. Area - 2500 sq.ft.
 - (c) Laboratory for biochemistry and pharmacology with store and preparation rooms separately for both subjects - 2500 sq.ft.
 - III. Clinical:**
 - (a) Prosthodontics - Plaster room
Polymers room
Wax room
Casting laboratory
Ceramic lab 2500 sq.ft.

- (b) Conservative Dentistry – Plaster room
Casting & ceramic laboratories ... 600 sq.ft.
- (c) Oral pathology for histopathology ... 600 sq.ft.
- (d) Haematology and clinical biochemistry: a laboratory for routine blood and biochemical investigation and urine analysis ... 300 sq.ft.

18. Distilled Water Plant

TEACHING AIDS:

Audiovisual – Adequate number of overhead projectors, slide projectors shall be provided in the lecture halls and seminar rooms attached to various departments. It is also desirable to have an LCD or DLP projector for multimedia presentations.

Computers – The administrative area, clinics, stores and library shall be provided with computers & printers preferably interconnected for better co-ordination.

General Hospital:

The applicant owns and manages a General Hospital of not less than 100 beds as per DCI (Establishment of New Dental Colleges, Opening of New or Higher Course of Study or Training and Increase of Admission Capacity in Dental Colleges) Regulations, 2006 with necessary infrastructure facilities including teaching pre-clinical, para-clinical and allied medical sciences in the campus of the proposed dental college,

or

The proposed dental college is located in the proximity of a Government Medical College or a Medical College recognised by the Medical Council of India and an undertaking of the said Medical College to the effect that it would facilitate training to the students of the proposed dental college in the subjects of Medicine, Surgery and Allied Medical Sciences has been obtained,

or

Where no Medical College is available in the proximity of the proposed dental college, the proposed dental college gets itself tied up at least for 5 years with a Government General Hospital having a provision of at least 100 beds and located within a radius of 10 K.M. of the proposed dental college and the tie-up is extendable till it has its own 100 bedded hospital in the same premises. In such cases, the applicant shall produce evidence that necessary infrastructure facilities including teaching pre-clinical, para-clinical and allied medical sciences are owned by the proposed dental college itself.

A 100 bedded teaching hospital should have a definite out patient departments, in-patient services and 24 hours emergency and critical care services. It should have a medical programme as under:-

I. MEDICAL PROGRAMME

A) Medical & Allied Disciplines

- General Medicine
- General Surgery
- Obstetrics and Gynaecology
- Orthopaedics
- Critical Medicine
- Emergency Medicine
- Otorhino Laryngology
- Paediatrics
- Pathology
- Anaesthesiology
- Blood Bank & Transfusion
- Community Medicine
- Hospital Administration

B) Nursing, Paramedical, Technical and Allied Services

- Dietetics and Therapeutics
- Drugs & Pharmacy
- ECG Technology
- Imaging Technology

- Central Sterile Supply department
- Physiotherapy
- Medical Record Sections

C) Engineering & Allied Services

- Fire protection
- Electrical
- Air conditioning/Central heating
- Medical Gases
- Refrigeration
- Central Workshop
- Ambulance Service
- Water Supply
- Sewage Treatment/Disposal and waste disposal cell

D) Administration and Ancillary Services

- General Administration
- Material Management
- Medical Social Worker
- PRO
- Library
- Security

II. FUNCTIONAL PROGRAMME**A) Site**

Site should be within 10 k.m. radius of the teaching block of Dental College - a site with high degree of sensitivity to outside noise should not be present. It should be accessible by transport and building should be well ventilated.

B) Category wise Bed Distribution

- | | |
|--|---------|
| (i) General Ward - Medical including allied specialities | 30 beds |
| (ii) General Ward - Surgical including allied specialities | 30 beds |
| (iii) Private Ward (A/C & Non A/C) | 9 beds |
| (iv) Maternity Ward | 15 beds |
| (v) Pediatric Ward | 6 beds |

The intensive care services for medical/surgical intensive care with bed complement of 4 beds (4% of bed strength).

The critical care services for medical/surgical emergencies with bed complement of 6 beds (6% of bed strength).

III. AREA REQUIREMENTS (AS PER BUREAU OF INDIAN STANDARDS)

- Covered area requirement is 20 sq. m. / bed
- Out of the total covered area
- 40% inpatient services
- 35% outpatient services
- 25% department and supportive services

IV. MAN POWER REQUIREMENTS

The consultants in the various departments should have atleast 8 years teaching experience after post graduation.

MEDICAL STAFF

- | | | |
|----------------------------|---|---|
| - General Surgery | - | 2 |
| - General Medicine | - | 2 |
| - Obstetrics & Gynaecology | - | 2 |
| - ENT | - | 2 |
| - Paediatrics | - | 2 |
| - Anaesthesia | - | 2 |
| - Orthopaedics | - | 2 |
| - Pharmacologist | - | 1 |
| - Radiologist | - | 1 |
| - G. DMO | - | 1 |
| - Community Medicine | - | 1 |
| - Hospital Administration | - | 1 |

NURSING STAFF

- Matron	-	1
- Sister in-charge	-	6
- O. T. Nurses	-	6
- General Nurses	-	20
- Labour Room Nurses	-	4

HEALTH STAFF

- Female Health Assistant	-	1
- Extension Educator	-	1
- Paramedical Staff	-	
- Lab Technician/Blood Bank Tech.	-	4
- ECG Technician	-	1
- Pharmacist	-	4
- Sr. Radiographer	-	1
- CSSD	-	2
- Medical Records	-	1

ENGINEERING STAFF

- Civil	-	2
- Mechanical	-	2
- Electrical	-	2
- Engineering aid	-	4

OTHER STAFF

- Drivers	-	2
- Carpenter	-	1
- Cooks	-	2
- Barber	-	1
- Class IV including chowkidars	-	55

ADMINISTRATIVE STAFF

- Office Superintendent	-	1
- Head Clerk	-	1
- Cashier	-	1
- Stenographer	-	1
- U.D.C.	-	2
- L.D.C.	-	4

Satellite Dental Clinics:

All the dental colleges are encouraged to establish atleast one or two satellite centers with all the infrastructural facilities within 50 kms distance to train and expose students in community oral health care programmes.

Dental Hospital:

The following are the clinical departments in a Dental College.

1. Oral Medicine and Radiology
2. Oral Pathology and Oral Microbiology
3. Public Health Dentistry
4. Paediatric and Preventive Dentistry
5. Orthodontics & Dental orthopaedics
6. Periodontology
7. Conservative Dentistry and Endodontics
8. Oral & Maxillofacial Surgery
9. Prosthodontics and Crown & Bridge

Out patients:

Since dentistry being more clinical oriented speciality, the Council desires that all the institutions make efforts to have adequate clinical material for satisfactory training of undergraduate students. There shall be atleast 75 to 100 new patients on an average each day in colleges with 50 admissions and 100 - 150 new patients in colleges with 100 admissions.

Each of the clinical departments should have the following functional areas -

50 ADMISSIONS:

- (a) Reception and waiting room - 200 sq.ft.
- (b) Undergraduate clinic adequate to accommodate the prescribed number of dental chairs and units.
- (c) Sterilization room where central sterilization facilities are not provided - 150 sq.ft.
- (d) Small department stores - 100 sq.ft.
- (e) Seminar room - 200 sq.ft.

Staff rooms :

- 1. H.O.Ds room - 180 sq.ft.
- 2. Readers' room - 150 sq.ft.
- 3. Lecturers' room - 250 sq.ft.

Note: Departments having postgraduate training should provide additional functional requirements as per MDS regulations.

Main reception and dental records section: 800 sq.ft.

100 ADMISSIONS:

- (a) Reception and waiting room - 300 sq.ft.
- (b) Undergraduate clinic adequate to accommodate the prescribed number of dental chairs and units.
- (c) Sterilization room where central sterilization facilities are not provided - 200 sq.ft.
- (d) Small department stores - 100 sq.ft.
- (e) Seminar room - 400 sq.ft.

Staff rooms:

- 1. H.O.Ds room - 180 sq.ft.
- 2. Readers' room - 150 sq.ft.
- 3. Lecturers' room - 300 sq.ft.

Note: Departments having postgraduate training should provide additional functional requirements as per MDS regulations.

Main reception and dental records section: 1500 sq.ft.

There should be adequate area for patients reception, waiting, registration, storage of patients records etc.

Requirement of dental chairs and units:

For 50 admissions - 100
For 100-admissions - 200

Note: Requirement of Dental Chairs for 1st and 2nd BDS will be as per DCI (Establishment of New Dental Colleges, Opening of New or Higher Course of Study or Training and Increase of Admission Capacity in Dental Colleges) Regulations, 2006.

Distribution of dental chairs and units in various departments (Specification is mentioned in the DCI Regulations 2006):

<u>Department</u>	<u>50 admissions</u>	<u>100 admissions</u>
Oral Medicine & Radiology	06	12
Oral Pathology & Oral Microbiology	01	02
Public Health Dentistry	08	16
Paediatrics and Preventive Dentistry	10	20
Orthodontics	09	18
Periodontology	17	34
Conservative Dentistry and Endodontics	17	34
Oral & Maxillofacial Surgery	15	30
Prosthodontics and Crown & Bridge	17	34
	100	200

Total approximate area for U.G. clinics (50 admissions) - 12,500 sq.ft.
Total approximate area for U.G. clinics (100 admissions) - 25,000 sq.ft.

EQUIPMENT REQUIREMENTS**Department : ORAL MEDICINE AND RADIOLOGY**

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
	(Space allocation for each Dental chair 100 Sq Ft in all the Departments)		
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air Ventury Suction, X-Ray viewer, 3 way syringe, instrument tray, Dental Operator's Stool with height adjustment.	6	12
Panoramic X-Ray with Cephalometric	Preferably digital	1	1
Intra Oral X-ray Unit	70 KV , 8mA, high frequency preferably Digital timer	2	3
Pulp testers	Digital	2	3
Automatic periapical X-ray Developer		1	1
Automatic Panoramic with Cephalometric X-ray Developer		1	1
X-ray viewer	For Panoramic and Cephalometric films	2	2
Radiovisiography	Digital Intra X-ray System with one Sensor and Software	1	1
General X-ray Unit		1	1
Ortho Pantmograph	preferably digital	1	1
Automatic Developers/ Dark Room		1	2
Lead aprons		2	2
Lead Gloves		1	1
X-ray Hangers		6	6
X-ray viewers		2	2
Diagnostic Kits	Mouth mirror, dental probe, college tweezers	20	40
Lead Screen		1	1
Biopsy Kit		1	1
Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	1	2
Computers	Minimum Pentium -IV	1	1
Intra Oral Camera	With High resolution	1	1
Needle Burner with Syringe Cutter		2	2

Department : ORAL PATHOLOGY AND ORAL MICROBIOLOGY

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	With shadowless lamp, spittoon, 3 way syringe, instrument tray and suction	1	2
Microscopes		20	40
Microtome		1	1
Wax bath		1	1
Water bath		1	1
Knife sharpner		1	1
Hot plate		1	1
Spencer knife		1	1

Department : PUBLIC HEALTH DENTISTRY

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, micromotor control light cure 3 way syringe, X-ray viewer, instrument tray Dental Operators stool with height adjustment With shadowless lamp, spittoon, 3 way syringe, instrument tray and suction, micromotor, airrotor, light cure	8	16
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters.	1	2
Ultrasonic cleaner	Minimum capacity 13 liters with mesh bucket with digital timer	1	2
Needle burner with syringe cutter		2	4
MOBILE CLINIC			
Mobile dental van	Mobile dental van with two dental chairs with all the attachments and adequate sitting space for 15 to 20 people		
Dental chair with unit	Hydraulically operated with spittoon attachment, halogen light with 2 intensity, air ventury suction, airrotor, micromotor, 3 way-scaler and light cure, x-ray viewer, instrument tray, operating stool.	2	
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters.	1	1
Intraoral x-ray	Portable, 70 KV, 8mA	1	1
Glass bead sterilizers		1	1
Compressor	1.25HP	1	1
Metal Cabinet	With wash basin	1	1
Portable dental chair	Suitcase unit with airrotor, micromotor, scaler and compressor 0.25HP	2	2
Stabilizer	4KV	1	1
Generator	4KV	1	1
Water tank	400litre	1	1
Oxygen cylinder		1	1
Public address system		1	1
TV and video cassette player		1	1
Demonstration models			

Department : PAEDIATRIC AND PREVENTIVE DENTISTRY

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power motorized evacuation system, Air rotor with miniature, Airrotor HPS, Micro motor with miniature contrangle Hand piece, 3 way syringe, ultrasonic sealer with 3 tips, Light cure unit LED based heat free, X-ray viewer, instrument tray Dental	10	20

	Operator's stool with height adjustment (Pedo chair preferred)		
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters.	1	2
Ultrasonic cleaner	Minimum capacity 13 liters with mesh bucket with digital timer	1	2
Needle Burner with syringe cutter		2	3
Amalgamator		1	1
Pulp Tester-Digital		1	1
Rubber dam kit for pedo		3	5
Apex locator		1	1
Endo motor	With torque control HPs	1	1
Injectable gutta percha with condensation		1	1
Radiovisiography	Digital intra X-ray system with pedo sensor and software	1	1
Intra Oral Camera	With high resolution	1	1
Scaling instruments		5	10
Restorative instruments		5	10
Extraction forceps		5	10
Intra-oral X-ray		1	1
Automatic Developer		1	1
Computer	Minimum Pentium IV	1	1
PEDO LAB			
Plaster dispenser	One each for plaster and stone plaster	2	2
Model Trimmer	With diamond disc	1	1
Model Trimer	Double disc one diamond and one carborandum disc	1	1
Welder with soldering attachments		1	1
Vibrator		2	2
Lab micro motor	Heavy duty with Hps	2	3
Dental Lathe		1	1
Model Trimmer		1	1
Steam cleaner		1	1
Pressure moulding machine		1	1
Carborandum Disc		1	1
Diamond disc		1	1

Department : ORTHODONTICS

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, micromotor control light cure 3 way syringe, X-ray viewer, instrument tray Dental Operators stool with height adjustment	9	18
Unit mount scaler		3	5
Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	1	2
Ultrasonic Cleaner	Minimum capacity 13 liters with mesh bucket with digital timer	1	2
ORTHO LAB			
Plaster dispenser	One each for plaster and stone plaster	2	2
Vibrator		2	2

Model Trimmer		1	2
Micromotor -	heavy duty	2	4
Lathe		1	2
X-ray viewers		2	2
OPG with cephalostat	If available in radiology its is adequate.	1	1
Welders		2	4
Blue Torch		1	1
Base Formers		2	4
Typodont		2	4
Set of Pliers		5	10
Welder with soldering attachments		1	1
Hydro solder		1	1
Typodont articulator	With metal teeth wax rim of Class I, II, III	3	4
Pressure moulding machine		1	1

Department : PERIODONTOLOGY

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, With shadowless lamp, spittoon, 3 way syringe, ultrasonic sealer with 3 tips, X-ray viewer, instrument tray dental operator's stool with height adjustment	17	34
	Note: Atleast 25% of the units should have the Airpolisher.		
Scaling instrument sets		5	10
Surgical instrument sets		3	6
Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	2	3
Ultrasonic scaler	Minimum capacity 13 liters with mesh bucket	1	2
Electro surgical cautery		1	1
Needle burner with syringe cutter		4	6
LASER	Soft tissue laser	1	1
Surgical motor with physio dispenser		1	1

Department : CONSERVATIVE DENTISTRY AND ENDODONTICS

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, With shadowless lamp, spittoon, 3 way syringe, ultrasonic sealer with 3 tips, X-ray viewer, instrument tray dental operator's stool with height adjustment	17	34

Rubber dam kits		4	6
Restorative instruments kits		5	10
R.C.T. instrument kits		5	10
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	2	3
Ultrasonic cleaner	Minimum capacity 13 liters with mesh bucket	1	2
Needle burner with syringe cutter		3	4
Amalgamator	With auto proportion, auto dispenser	2	3
Rubber dam kits		4	6
Pulp Tester-Digital		2	4
Apex Locator		1	2
Glass bead sterilizers		4	6
Plaster dispensers		2	2
Vibrator		1	2
Ceramic Unit		1	1
Casting machine		1	1
Intra-oral X-ray Unit	Proper radiation safety	1	1
Automatic Developer		1	1
Radiovisiography	RVG with Computer	1	1
Endo motor	With torque control Hps	1	1
Bleaching unit		1	1
Magnification loops		1	2
Injectable gutta percha		1	2
PHANTOM LAB UNIT	Phantom Table fitted with Halogen Operating Light Phantom Head body type neck joint for all the movement, TMJ movement. Modular with Air rotor, Micro motor with contra angle Hps, 3-way syringe, jaw with ivory teeth, preferably soft gingival, dental operator's stool (not to use extracted or cadaver teeth).	30	60

CHEMICAL LABORATORY

Plaster Dispenser	One each for plaster and stone plaster	2	2
Model Trimmer	Carborandum disc	1	1
	Diamond disc	1	1
Lathe	Heavy Duty	1	2
Lab Micromotor	With heavy duty handpiece	2	3
Ultrasonic cleaner	Minimum capacity 5 liters	1	1
Spindle Grinder		1	1
Vibrator		1	2
Burnout furnace		1	1
Porcelain furnace		1	1
Sandblasting Machine		1	1
Lab Airrotor		1	1
Pindex System		1	1
Circular saw		1	1
Vacuum mixer		1	1
Pneumatic chisel		1	1
Casting machine	Motor cast/induction casting preferred	1	1

Department : ORAL & MAXILLOFACIAL SURGERY

A) EXODONTIA

NAME	SPECIFICATION	QUANTITY
		50 100
		Adms. Adms.

Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, X-ray viewer, 3 way syringe, instrument tray Dental Operator's stool and height adjustment and suction, Micromotor/ Airrotor	15	30
Autoclaves	Front loading Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	2	2
Ultrasonic Cleaner	Minimum capacity 13 liters with mesh bucket	1	2
Needle burner with syringe cutter		4	6
Extraction forceps sets	Complete set	10	20
Dental elevators	Complete set	5	10
Minor Oral surgery kits		3	6
Emergency drugs tray		1	1
Oxygen cylinder with mask		1	1
X-ray viewers		2	2
Computer	Minimum Pentium IV	1	1

B) MINOR SURGERY

Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, 3 way syringe, instrument tray Dental Operator's stool and height adjustment and suction,	3	5
-------------------------	---	---	---

Department : PROSTHODONTICS AND CROWN & BRIDGE

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, 3 way syringe, ultrasonic sealer with 3 tips, Light cure unit, instrument tray and suction, Dental operator stool with height adjustment Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, instrument tray, Dental operator stool with height adjustment	17	34
Semi adjustable articulator	With face bow	2	2
Extra oral/intra oral tracer		2	2
Dewaxing unit		1	2
Curing unit		1	2
Dental casting machine		1	1
Wax burnout furnace		1	1
Pre heating furnace		1	1
Surveying unit		1	2

Heavy duty hand piece	Lab micromotors	3	4
Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	1	2
Needle burner with syringe cutter		1	2
Plaster Dispenser	One each for plaster and stone plaster	2	2
Model Trimmer with Carborandum Disc		1	1
Model Trimmer with Diamond Disc		1	2
Acrylizer		2	3
Lathe		1	2
Flask press		4	4
Deflasking unit		4	4
Dewaxing unit		2	3
Hydraulic Press		2	3
Mechanical Press		1	2
Vacuum mixing machine		1	1
Lab Micro motor	With heavy duty handpiece	3	4
Curing pressure pot		1	1
Porcelain furnace		1	2
Vibrator		1	2
Sand blasting unit		2	2
Ultrasonic cleaner		1	2
Model Trimmer		2	4
Hot water sterilizer		1	2
Geyser	Compound bath	1	2
H.P. grinder with suction		2	3
Heavy duty lathe		2	2
Phantom heads		50	50
Pre-clinical working tables	Gas connection & bunsen burner	50	100

CERAMIC AND CAST PARTIAL LABORATORY

NAME	SPECIFICATIONS	50 ADMN	100 ADMN
Plaster Dispensor	One each for plaster and stone plaster	2	2
Duplicator		1	1
Pindex System		1	1
Circular saw		1	1
Burn out furnace		1	1
Sandblasting machine	With two containers	1	1
Electro-polisher		1	1
Model Trimmer with Carborandum disc		1	1
Model Trimmer with Diamond disc		1	1
Induction casting machine		1	1
Programmable porcelain furnace with vacuum pump with instrument kit and material kit		1	1
Spot welder with soldering, attachment of cable		1	1
Vacuum mixing machine		1	1
Steam Cleaner		1	1
Spindle Grinder 24,000 RPM with vacuum suction		1	1

Wax heater		1	1
Wax carver		1	1
Curing pressure pot		1	1
Milling machine		1	1
Heavy duty lathe with suction		1	1
Preheating furnace		1	1
Palatal trimmer		1	1
Ultrasonic cleaner	5 liters capacity	1	1
Composite curing unit		1	1
Micro surveyor		1	1
PRE-CLINICAL PROSTHETICS LABORATORY	Work table preferably complete stainless steel fitted with light, Bunsen burner, air blower, working stool. Adequate number of lab micro motor with attached hand piece	30	60
		10	20
PLASTER ROOM FOR PRE-CLINICAL WORK			
Plaster dispenser	One each for plaster and stone plaster	2	2
Vibrator		2	2
Lathe		2	2
Model Trimmer		1	1
Carborandum Disc		1	1
Diamond disc		1	1

MINIMUM BASIC QUALIFICATION AND TEACHING EXPERIENCE REQUIRED FOR TEACHERS FOR UNDER-GRADUATE DENTAL STUDIES.

(A) Dental Staff

Principal/Dean:	Same qualifications as prescribed for a Professor. Experience as Professor for not less than 5 years in a Dental Institution.
Professors:	A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification /Diplomate of National Board in the subject and with 5 years teaching experience as Reader. as first author with at least one paper in the National/International Journal.
Readers:	A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification /Diplomate of National Board in the subject and with 4 years teaching experience after post-graduation. as first author with at least one paper in the National/International Journal.
Lecturers:	A recognised MDS Degree of an Indian University/Diplomate of National Board or an equivalent qualification.
Tutors	A recognised BDS Degree of Indian University or an equivalent qualification with at least one year experience.

Note:

In case of individuals with discrepancy between teaching experience and the post-graduate qualification, a reference may be made to the Dental Council of India through competent authority for consideration. This is not applicable for future entrants.

(B) Medical Staff

The requirement of medical-teaching staff is to be as per DCI Regulations 2006. Qualification and Teaching Experience of the medical teaching staff will be as per MCI Regulations.



भारत का राजपत्र The Gazette of India

असाधारण
EXTRAORDINARY
भाग III—खण्ड 4
PART III—Section 4
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 193]
No. 193]

नई दिल्ली, बुधस्वतिवार, सितम्बर 27, 2007/आश्विन 5, 1929
NEW DELHI, THURSDAY, SEPTEMBER 27, 2007/ASVINA 5, 1929

DENTAL COUNCIL OF INDIA

CORRIGENDA

New Delhi, the 27th September, 2007

No. DE-22-2007.—In exercise of the powers conferred by Section 20 of the Dentists Act, 1948, the Dental Council of India with the previous sanction of the Central Government hereby makes the following Amendments to the Revised BDS Course Regulations published in Part III, Section 4 of Government of India Gazette dated 10th September, 2007.

1. Short title and commencement.—(1) These Regulations may be called the Dental Council of India Revised BDS Course Regulations (Amendments) 2007.

(ii) They shall come into force on the date of their publication in the Official Gazette.

In the Title

Minimum Basic Qualification and Teaching Experience required for Teachers for Under-graduate Dental Studies.

(1) Against Professors

Delete the words :—

“Shall have published atleast two papers as first author in his speciality in any National/international journal.”

(2) Against Readers :—

Delete the words :—

“Shall have published atleast one paper as first author in his speciality in any National/international journal.”

Maj. Gen. (Retd.) P. N. AWASTHI, Secy.

[ADVT-III/IV/98/2007-Exty.]

4020 GI/2007

Printed by the Manager, Govt. of India Press, Ring Road, Mayapuri, New Delhi-110064
and Published by the Controller of Publications, Delhi-110054.

**MINIMUM STAFFING PATTERN FOR UNDER GRADUATE DENTAL STUDIES FOR 50 ADMISSIONS
(As per DCI Regulations 2006)**

Principal/Dean: - 1 (One post of Professor can be deleted in the under mentioned tabulation according to the subject of specialisation)
Each Dental Department should be headed by a Professor.

	I Year			II Year			III Year			Total Posts in position from the beginning of 3 rd year onwards	
	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader
	2*	2	10	3*	4	20	6*	11	30	6	11
Prosthodontics and Crown & Bridge	1	1	-	1	2	-	1	2	-	1	2
Oral Pathology and Oral Microbiology	-	-	-	-	1	-	1	1	-	1	1
Conservative Dentistry and Endodontics	-	1	-	1	1	-	1	2	-	1	2
Oral & Maxillofacial Surgery	-	-	-	-	-	-	1	1	-	1	1
Periodontology	-	-	-	-	-	-	1	1	-	1	1
Orthodontics	-	-	-	-	-	-	1	1	-	1	1
Paediatric & Preventive Dentistry	-	-	-	-	-	-	-	1	-	-	1
Oral Medicine & Radiology	-	-	-	-	-	-	-	1	-	-	1
Public Health Dentistry	-	-	-	-	-	-	-	1	-	-	1
Dental Materials	-	-	-	-	-	-	-	-	-	-	-
Dental Anatomy, Embryology & Oral Histology	-	-	-	-	-	-	-	-	-	-	-

* Includes the Principal who can head any one of the six specialities.
25% MDS and 75% BDS.

MINIMUM STAFFING PATTERN FOR UNDER GRADUATE DENTAL STUDIES FOR 100 ADMISSIONS

(As per DCI Regulations 2006)

Each Dental Department should be headed by a Professor

	I Year				II Year				III Year				Total Posts in position from the beginning of 3 rd year onwards	
	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor		
Prosthodontics and Crown & Bridge	2*	3	16	4*	5	30	6*	13	40	6*	13	40#		
Oral Pathology and Oral Microbiology	1	2	-	1	2	-	1	2	-	1	2	-		
Conservative Dentistry and Endodontics	-	-	-	1	1	-	1	1	-	1	1	-		
Oral & Maxillofacial Surgery	-	1	-	1	2	-	1	2	-	1	2	-		
Periodontology	-	-	-	-	-	-	1	2	-	1	2	-		
Orthodontics	-	-	-	-	-	-	1	2	-	1	2	-		
Paediatric & Preventive Dentistry	-	-	-	-	-	-	1	2	-	1	2	-		
Oral Medicine & Radiology	-	-	-	-	-	-	1	1	-	1	1	-		
Public Health Dentistry	-	-	-	-	-	-	-	-	-	-	-	-		
Dental Materials	-	-	-	-	-	-	-	-	-	-	-	-		
Dental Anatomy, Embryology & Oral Histology	-	-	-	-	-	-	-	-	-	-	-	-		

* Includes the Principal who can head any one of the six specialities.

25% MDS and 75% BDS.

**Medical Teaching Staff in a Dental College
(As per DCI Regulations 2006)**

Year	Subjects	Intake and Designation					
		50 Admissions			100 Admissions		
		Prof	Reader	Lecturer	Prof	Reader	Lecturer
I	Anatomy	-	1	2	-	1	4
I	Physiology	-	1	2	-	1	2
I	Biochemistry	-	1	2	-	1	2
II	Pharmacology	-	1	2	-	1	3
II	General Pathology	-	1	2	-	1	2
II	Microbiology	-	1	2	-	1	2
III	General Medicine	-	1	2	-	1	3
III	General Surgery	-	1	2	-	1	3
III	Anaesthesia	-	1	1	-	1	1

OTHER STAFF PATTERN FOR 50 ADMISSIONS

Administrative Officer 1
Secretary to Dean 1
Public Relation officer 1

Designation	Receptionist	Establishment	Accounts	Admissions	Exams	Stores	Library	Maintenance	Security	Illustration	Clinical Dept's.	Computer	Laboratories	Sports	Total
Managers/Office Suptd.		1	1						1			1			4
Assistants		1	1	1	1	1	2	1							8
Receptionist	8														8
Librarian							1								1
D.S.A.(Chair side Attendant)											10				10
Dent. Tech. (Dental Mechanic)											6				6
Dent. Hygst.											3				3
Radiographer											2				2
Photographer										1					1
Artist										1					1
Programmer												1			1
Data Entry Operators												1			1
Physical Director														1	1
Engineer								1							1
Electricians								2							2
Plumber								1							1
Carpenter								1							1
Mason								1							1
A.C. Tech.								1							1

Helpers Electrical								1							1
Sweepers & Scavengers							2	2			3		3		10
Attenders	2	1	1		1	1	1	2			4	1	4		18
Security Personal									5						5
Dept. Secretaries											4				4
Driver									4						4
Nurses											3				3
Lab. Technicians												3			3

Note:

The above staff pattern indicates minimum requirements for the stipulated admissions. However, the actual staff requirements may marginally vary depending upon the patients' flow, work culture and design of the building.

OTHER STAFF PATTERN FOR 100 ADMISSIONS

Administrative Officer 1
Secretary to Dean 1
Public Relation officer 1

Designation	Receptionist	Establishment	Accounts	Admissions	Exams	Stores	Library	Maintenance	Security	Illustration	Clinical Dept.	Computer	Laboratories	Sports	Total
Managers / Office Supdt.	1	1	1		1	1			1			1			7
Assistants		2	2	2	1	1	4	1							13
Receptionist	14														14
Librarian							1								1
D.S.A.(Chair side Attendant)											20				20
Dent. Tech.(Dental Mechanic)											10				10
Dent. Hygst.											5				5
Radiographer										1	3				3
Photographer										1					1
Artist															1
Programmer												1			1
Data Entry Operators												2			2
Physical Director														1	1
Engineer								1							1
Electricians								4							4
Plumber								2							2
Carpenter								1							1
Mason								1							1
A.C. Tech.								1							1
Helpers Electrical								3							3
Sweepers & Scavengers								2	4			5		6	17
Attenders	3	1	1		1	2	2	3			5	1	6		25
Security Personal									6						6
Dept. Secretaries											8				8
Driver									5						5
Nurses											9				9
Lab. Technicians													5		5

Note:

The above staff pattern indicates minimum requirements for the stipulated admissions. However, the actual staff requirements may marginally vary depending upon the patients' flow, work culture and design of the building.

SYLLABUS OF STUDY**1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS****A) GOAL**

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

B) OBJECTIVES :**a) KNOWLEDGE & UNDERSTANDING:**

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

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

b) SKILLS

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

C) INTEGRATION

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

This insight is gained in a variety of ways:

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

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

D) AN OUTLINE OF THE COURSE CONTENT:

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

6. Histology of basic tissues and of the organs of gastrointestinal, respiratory, Endocrine, excretory systems & gonads.
7. Medical genetics.

E) FURTHER DETAILS OF THE COURSE.

I. INTRODUCTION TO :

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

II. HEAD & NECK:

01: Scalp, face & temple, lacrimal apparatus 02. Neck - Deep fascia of neck, posterior triangle, suboccipital triangle, anterior triangle, anterior median region of the neck, deep structures in the neck. 03. Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain; pituitary gland. 04. Cranial nerves - III, IV, V, VI, VII, IX, XII in detail. 05. Orbital cavity - Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit. 06. Parotid gland. 07. Temporo mandibular joint, muscles of mastication, infratemporal fossa; pterygo - palatine fossa. 08. Submandibular region 09. Walls of the nasal cavity, paranasal air sinuses 10. Palate 11. Oral cavity, Tongue 12. Pharynx (palatine tonsil and the auditory tube) Larynx. **OSTEOLOGY** - Foetal skull, adult skull, individual bones of the skull, hyoid bone and cervical vertebrae

III. THORAX : Demonstration on a dissected specimen of

1. Thoracic wall
2. Heart chambers
3. Coronary arteries
4. Pericardium
5. Lungs - surfaces ; pleural cavity
6. Diaphragm

IV. ABDOMEN : Demonstration on a dissected specimen of

1. Peritoneal cavity
2. Organs in the abdominal & pelvic cavity.

V. CLINICAL PROCEDURES :

- a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.
 1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
 2. Gluteal region and the relation of the sciatic nerve.
 3. Vastus lateralis muscle.
- b) Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.
 1. Median cubital vein 2. Cephalic vein 3. Basilic vein 4. Long saphenous vein
- c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.
 1. Superficial temporal 2. Facial 3. Carotid 4. Axillary 5. Brachial 6. Radial 7. Ulnar 8. Femoral 9. Popliteal 10. Dorsalis pedis
- d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equina & epidural space and the inter vertebral space between L4 & L5.

VI. EMBRYOLOGY :

Oogenesis, Spermatogenesis, Fertilisation, Placenta, Primitive streak, Neural crest, Bilaminar and trilaminar embryonic disc, Intra embryonic mesoderm - formation and fate, notochord formation & fate, Pharyngeal arches, pouches & clefts, Development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands, and anomalies in their development, Tooth development in brief.

VII. HISTOLOGY :

The Cell :

Basic tissues - Epithelium, Connective tissue including cartilage and bone, Muscle

Tissue, Nervous tissue : Peripheral nerve, optic nerve, sensory ganglion, motor ganglion, Skin

Classification of Glands

Salivary glands (serous, mucous and mixed gland), Blood vessels, Lymphoid tissue
Tooth, lip, tongue, hard palate, oesophagus, stomach, duodenum, ileum, colon,
vermiform appendix Liver, Pancreas, Lung, Trachea, Epiglottis, Thyroid gland, para
thyroid gland, supra renal gland and pituitary gland, Kidney, Ureter, Urinary
bladder, Ovary and testis.

VIII. MEDICAL GENETICS :

Mitosis, meiosis, Chromosomes, gene structure, Mendelism, modes of inheritance

RECOMMENDED BOOKS:

1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown & company, Boston.
2. R.J. LAST'S Anatomy – McMinn, 9th edition.
3. ROMANES(G.J.) Cunningham Manual of Practical Anatomy ; Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.
4. WHEATER, BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
5. SADLER, LANGMAN'S, Medical Embryology, Ed. 6.
6. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
7. WILLIAMS, Gray's Anatomy, Ed.38, Churchill Livingstone.
8. EMERY, Medical Genetics.

2. HUMAN PHYSIOLOGY

A) GOAL

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

OBJECTIVES

a) KNOWLEDGE

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

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

b) SKILLS

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

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

c) INTEGRATION

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

B) COURSE CONTENTS THEORY

1. GENERAL PHYSIOLOGY

1. Homeostasis: Basic concept, Feed back mechanisms
2. Structure of cell membrane, transport across cell membrane
3. Membrane potentials

2. BLOOD:

Composition & functions of blood.

Specific gravity, Packed cell volume, factors affecting & methods of determination.

Plasma proteins - Types, concentration, functions & variations.

Erythrocyte - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.

ESR- Methods of estimation, factors affecting, variations & significance.

Haemoglobin - Normal concentration, method of determination & variation in concentration.

Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.

Anaemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigments, Jaundice - types.

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

Thrombocytes - Morphology, number, variations, function & thrombopoiesis.

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

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

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

Blood volume: Normal values, variations.

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

Tissue fluids & lymph: Formation of tissue fluid, composition, circulation & functions of lymph. Oedema - causes.

Functions of reticulo endothelial system.

3. MUSCLE AND NERVE

Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction, neuromuscular transmission. Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.

4. DIGESTIVE SYSTEM :

Introduction to digestion : General structure of G.I. tract, Innervation.

Salivary glands: Structure of salivary glands, composition, regulation of secretion & functions of saliva.

Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.

Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.

Liver: structure, composition of bile, functions of bile, regulation of secretion -

Gall bladder: structure, functions.

Small intestine - Composition, functions & regulation of secretion of intestinal juice.

Large intestine - Functions.

Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

5. EXCRETORY SYSTEM :

Structure & functions of kidney, functional unit of kidney & functions of different parts. Juxta glomerular apparatus, renal blood flow.

Formation of Urine: Glomerular filtration rate - definition, determination, normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances. Tubular secretion - secretion of urea, hydrogen and other substances.

Mechanism of concentration & dilution of urine.

Role of kidney in the regulation of pH of the blood.

Micturition: anatomy & innervation of Urinary bladder, mechanism of micturition & abnormalities.

6. BODY TEMPERATURE & FUNCTIONS OF SKIN

7. ENDOCRINOLOGY

General endocrinology - Enumeration of endocrine glands & hormones - General functions of endocrine system, chemistry, mechanism of secretion, transport, metabolism, regulation of secretion of hormones.

Hormones of anterior pituitary & their actions, hypothalamic regulation of anterior pituitary function. Disorders of secretion of anterior pituitary hormones.

Posterior pituitary: Functions, regulation & disorders of secretion.

Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders, Thyroid function tests.

Adrenal cortex & Medulla - synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders.

Other hormones - Angiotensin, A.N.F.

8. REPRODUCTION

Sex differentiation, Physiological anatomy of male and female sex organs,

Female reproductive system: Menstrual cycle, functions of ovary, actions of oestrogen &

Progesterone, control of secretion of ovarian hormones, tests for ovulation, fertilisation, implantation, maternal changes during pregnancy, pregnancy tests & parturition.
Lactation, composition of milk, factors controlling lactation, milk ejection, reflex.
Male reproductive system : spermatogenesis, semen and contraception.

9. CARDIO VASCULAR SYSTEM

Functional anatomy and innervation of heart Properties of cardiac muscle
Origin & propagation of cardiac impulse and heart block.
Electrocardiogram - Normal electrocardiogram. Two changes in ECG in myocardial infarction.
Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta.
Volume changes in ventricles. Jugular venous pulse, arterial pulse.
Heart sounds: Mention of murmurs.
Heart rate: Normal value, variation & regulation.
Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.
Arterial blood pressure: Definition, normal values & variations, determinants, regulation & measurement of blood pressure.
Coronary circulation.
Cardio vascular homeostasis - Exercise & posture.

10. RESPIRATORY SYSTEM

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

11. CENTRAL NERVOUS SYSTEM

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

12. SPECIAL SENSES

Fundamental knowledge of vision, hearing, taste and smell.

PRACTICALS

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

PROCEDURES

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

7. Examination of pulse
8. Recording of blood pressure.

DEMONSTRATION:

1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility
4. Determination of vital capacity and timed vital capacity
5. Skeletal muscle experiments.

Study of laboratory appliances in experimental physiology. Frog's gastrocnemius sciatic preparation. Simple muscle curve, effects of two successive stimuli, effects of increasing strength of stimuli, effects of temperature, genesis of fatigue and tetanus. Effect of after load and free load on muscle contraction, calculation of work done.

6. Electrocardiography: Demonstration of recording of normal Electro cardiogram
7. Clinical examination of cardiovascular and respiratory system.

TEXT BOOKS:

- Guyton; Text book of Physiology, 9th edition.
 Ganong; Review of Medical Physiology, 19th edition
 Vander; Human physiology, 5th edition
 Choudhary; Concise Medical Physiology, 2nd edition
 Chatterjee; Human Physiology, 10th edition
 A.K. Jain; Human Physiology for BDS students, 1st edition

BOOKS FOR REFERENCE:

- i) Berne & Levy; Physiology, 2nd edition
- ii) West-Best & Taylor's, Physiological basis of Medical Practise, 11th edition

EXPERIMENTAL PHYSIOLOGY:

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

BIOCHEMISTRY**AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY**

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

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

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

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

1. Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma.
2. Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.
3. Need not know the details of alpha - helix and beta - pleats in proteins.
Should know why haemoglobin is globular and keratin is fibrous.

4. Need not know mechanism of oxidative phosphorylation.
Should know more than 90 % of ATP is formed by this process.
5. Need not know details of the conversion of pepsinogen to pepsin.
Should know hydrochloric acid cannot break a peptide bond at room temperature.
6. Need not remember the steps of glycogenesis.
Should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.
7. Need not know about urea or creatinine clearance tests.
Should know the basis of increase of urea and creatinine in blood in renal insufficiency.
8. Need not know the structure of insulin.
Should know why insulin level in circulation is normal in most cases of maturity onset diabetes.
9. Need not know the structural details of ATP.
Should know why about 10 g of ATP in the body at any given time meets all the energy needs.
10. Need not know the mechanism of action of prolylhydroxylase.
Should know why the gum bleeds in scurvy.
11. Need not know the structure of Vitamin K.
Should know the basis of internal bleeding arising due to its deficiency.
12. Need not remember the structure of HMGCoA.
Should know why it does not lead to increased cholesterol synthesis in starvation.

BIOCHEMISTRY AND NUTRITION

1. CHEMISTRY OF BIOORGANIC MOLECULES

Carbohydrates: Definition, biological importance and classification. Monosaccharides. Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Structures of starch and glycogen.

Lipids : Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol, Bile salts. Micelle. Bimolecular leaflet.

Proteins: Biological importance. Amino acids: Classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properties. Buffer action. Introduction to protein conformation : Denaturation.

Nucleic acids: Building units. Nucleotides. Outline structure of DNA and RNA.

High energy compounds: ATP, Phosphorylamidines, Thioesters, Enol phosphates.

2. MACRONUTRIENTS AND DIGESTION

Energy needs: Basal metabolic rate. Dietary carbohydrates, fibres. Dietary lipids, essential fatty acids. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for evaluation of protein quality to be excluded). Protein calorie malnutrition. Balanced diet.

Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides. Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids.

3. MICRONUTRIENTS

Vitamins: Definition, classification, daily requirement, sources and deficiency symptoms. Brief account of water-soluble vitamins with biochemical functions. Vitamins A functions including visual process. Vitamin D and its role in calcium metabolism. Vitamin E. Vitamin K and gamma carboxylation. Introduction to antivitamins and hypervitaminosis.

Minerals :Classification, daily requirement. Calcium and phosphate: sources, uptake, excretion, function. Serum calcium regulation. Iron: sources, uptake and transport.

Heme and nonheme iron functions; deficiency. Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess. Indications of role of other minerals.

4. ENERGY METABOLISM

Overview: Outlines of glycolysis, pyruvate oxidation and citric acid cycle. Beta oxidation of fatty acids. Electron transport chain and oxidative phosphorylation. Ketone body formation and utilisation. Introduction to glycogenesis, glycogenolysis, fatty acid synthesis, lipogenesis

and lipolysis. Gluconeogenesis. Lactate metabolism. Protein utilisation for energy. Glucogenic and ketogenic amino acids. Integration of metabolism.

5. SPECIAL ASPECTS OF METABOLISM

Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation. Phosphocreatine formation. Transmethylation. Amines. Introduction to other functions of amino acids including one carbon transfer. Detoxication: Typical reactions. Examples of toxic compounds. Oxygen toxicity.

6. BIOCHEMICAL GENETICS AND PROTEIN SYNTHESIS

Introduction to nucleotides; formation and degradation. DNA as genetic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogenes.

7. ENZYME AND METABOLIC REGULATION

Enzymes: Definition, classification, specificity and active site. Cofactors. Effect of pH, temperature and substrate concentration. Introduction to enzyme inhibitors, proenzymes and isoenzymes. Introduction to allosteric regulation, covalent modification and regulation by induction/repression.

Overview of hormones. Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief. Acid base regulation. Electrolyte balance.

8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS

Connective tissue: Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis. Introduction to cytoskeleton. Myofibril and muscle contraction in brief.

Haemoglobin: functions. Introduction to heme synthesis and degradation. Plasma proteins: classification and separation. Functions of albumin. A brief account of immunoglobulins. Plasma lipoproteins: Formation; function and turnover.

9. MEDICAL BIOCHEMISTRY

Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Hyperthyroidism and hypothyroidism: Biochemical evaluation. Hyperlipoproteinemias and atherosclerosis, Approaches to treatment. Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. Brief introduction to kidney function tests and gastric function tests. Acid base imbalance. Electrolyte imbalance: evaluation. Gout. Examples of genetic disorders including lysosomal storage disorders, glycogen storage disorders, glucose 6-phosphate dehydrogenase deficiency, hemoglobinopathies, inborn errors of amino acid metabolism and muscular dystrophy (one or two examples with biochemical basis will be adequate). Serum enzymes in diagnosis.

PRACTICALS: Contact hours 50

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

- | | |
|--|---|
| 19. Urea, uric acid creatinine profile in kidney disorders | 1 |
| 20. Blood gas profile in acidosis/ alkalosis | 1 |

RECOMMENDED BOOKS:

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. Lecture notes in Biochemistry 1984, J.K. Kandlish

Reference books:

1. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
2. Harper's Biochemistry, 1996., R.K. Murray et.al
3. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C. Elliot

3. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY**INTRODUCTION**

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

SKILLS

The student should acquire basic skills in :

1. Carving of crowns of permanent teeth in wax.
2. Microscopic study of Oral tissues.
3. Identification of Deciduous & Permanent teeth.
4. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

OBJECTIVES

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

I. TOOTH MORPHOLOGY

1. Introduction to tooth morphology:
 - ♦ Human dentition, types of teeth, & functions, Palmer's & Binomial notation systems, tooth surfaces, their junctions - line angles & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures - Clinical significance.
2. Morphology of permanent teeth :
 - ♦ Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.
 - ♦ Variations & Anomalies commonly seen in individual teeth.
3. Morphology of Deciduous teeth :
 - ♦ Generalized differences between Deciduous & Permanent teeth.
 - ♦ Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.
4. Occlusion :
 - ♦ Definition, factors influencing occlusion - basal bone, arch, individual teeth, external & internal forces & sequence of eruption.
 - ♦ Inclination of individual teeth - compensatory curves.
 - ♦ Centric relation & Centric occlusion - protrusive, retrusive & lateral occlusion.
 - ♦ Clinical significance of normal occlusion.
 - ♦ Introduction to & Classification of Malocclusion.

II. ORAL EMBRYOLOGY

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

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

III. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations - Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine ; Pulp calcifications & Hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.
3. Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinization, clinical parts of gingiva, Dentogingival & Mucocutaneous junctions & lingual papillae. Age changes & clinical considerations.
4. Salivary Glands :
 - ♦ Detailed microscopic study of acini & ductal system.
 - ♦ Age changes & clinical considerations.
5. TM Joint :
 - ♦ Review of basic anatomical aspects & microscopic study & clinical considerations.
6. Maxillary Sinus :
 - ♦ Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.
7. Processing of Hard & soft tissues for microscopic study :
 - ♦ Ground sections, decalcified sections & routine staining procedures.
8. Basic histochemical staining patterns of oral tissues.

IV. ORAL PHYSIOLOGY

1. Saliva :
 - ♦ Composition of saliva - variations, formation of saliva & mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.
2. Mastication :
 - ♦ Masticatory force & its measurement - need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.
3. Deglutition :
 - ♦ Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.
4. Calcium, Phosphorous & fluoride metabolism :
 - ♦ Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis.
5. Theories of Mineralization :
 - ♦ Definition, mechanisms, theories & their drawbacks.
 - ♦ Applied aspects of physiology of mineralization, pathological considerations - calculus formation.
6. Physiology of Taste :
 - ♦ Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects - taste disorders.
7. Physiology of Speech :
 - ♦ Review of basic anatomy of larynx & vocal cords.
 - ♦ Voice production, resonators, production of vowels & different consonants - Role of palate, teeth & tongue.
 - ♦ Effects of dental prosthesis & appliances on speech & basic speech disorders.

RECOMMENDED TEXT BOOKS

1. Orban's Oral Histology & Embryology - S.N.Bhaskar
2. Oral Development & Histology - James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major.M.Ash
4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

4. GENERAL PATHOLOGY**AIM:**

At the end of the course the student should be competent to:

Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

OBJ. TIVES:

Enabling the student

1. To demonstrate and apply basic facts, concepts and theories in the field of Pathology.
2. To recognize and analyze pathological changes at macroscopically and microscopical levels and explain their observations in terms of disease processes.
3. To Integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
4. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
5. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

COURSE CONTENT**A. General Pathology -**

1. Introduction to Pathology
 - Terminologies
 - The cell in health
 - The normal cell structure
 - The cellular functions
2. Etiology and Pathogenesis of Disease
 - Cell Injury
 - Types - congenital
 - Acquired
 - Mainly Acquired causes of disease
 - (Hypoxic injury, chemical injury, physical injury, immunological injury)
3. Degenerations
 - Amyloidosis
 - Fatty change
 - Cloudy swelling
 - Hyaline change, mucoid degeneration
4. Cell death & Necrosis
 - Apoptosis
 - Def, causes, features and types of necrosis
 - Gangrene - Dry, wet, gas
 - Pathological Calcifications
 - (Dystrophic and metastatic)
5. Inflammation
 - Definition, causes types, and features
 - Acute inflammation
 - a. The vascular response
 - b. The cellular response
 - c. Chemical mediators
 - d. The inflammatory cells
 - e. Fate
 - Chronic inflammation
 - Granulomatous inflammation
6. Healing
 - Regeneration
 - Repair
 - a. Mechanisms
 - b. Healing by primary intention
 - c. Healing by secondary intention
 - d. Fracture healing
 - e. Factors influencing healing process
 - f. Complications
7. Tuberculosis

- Epidemiology
- Pathogenesis (Formation of tubercle)
- Pathological features of Primary and secondary TB
- Complications and Fate
- 8. Syphilis
 - Epidemiology
 - Types and stages of syphilis
 - Pathological features
 - Diagnostic criterias
 - Oral lesions
- 9. Typhoid
 - Epidemiology
 - Pathogenesis
 - Pathological features
 - Diagnostic criterias
- 10. Thrombosis
 - Definition, Pathophysiology
 - Formation, complications & Fate of a thrombus
- 11. Embolism
 - Definition
 - Types
 - Effects
- 12. Ischaemia and Infraction
 - Definition, etiology, types
 - Infraction of various organs
- 13. Derangements of body fluids
 - Oedema - pathogenesis
 - Different types
- 14. Disorders of circulation
 - Hyperaemia
 - Shock
- 15. Nutritional Disorders
 - Common Vitamin Deficiencies
- 16. Immunological mechanisms in disease
 - Humoral & cellular immunity
 - Hypersensitivity & autoimmunity
- 17. AIDS and Hepatitis.
- 18. Hypertension
 - Definition, classification
 - Pathophysiology
 - Effects in various organs
- 19. Diabetes Mellitus
 - Def, Classification, Pathogenesis, Pathology in different organs
- 20. Adaptive disorders of growth
 - Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia
- 21. General Aspects of neoplasia
 - a. Definition, terminology, classification
 - b. Differences between benign and malignant neoplasms
 - c. The neoplastic cell
 - d. Metastasis
 - e. Etiology and pathogenesis of neoplasia, Carcinogenesis
 - f. Tumour biology
 - g. Oncogenes and anti-oncogenes
 - h. Diagnosis
 - i. Precancerous lesions
 - j. Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenoca, Fibroma & Fibrosarcoma, Lipoma and liposarcoma
- B. Systemic Pathology -
- 22 Anaemias
 - Iron Deficiency anaemia, Megaloblastic anaemia
- 23. Leukaemias

- Acute and chronic leukaemias, Diagnosis and clinical features
- 24. Diseases of Lymph nodes
 - Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma
- 25. Diseases of oral cavity
 - Lichen planus, Stomatitis, Leukoplakia, Sq cell Ca, Dental caries, Dentigerous cyst, Ameloblastoma
- 26. Diseases of salivary glands
 - Normal structure, Sialadenitis, Tumours
- 27. Common diseases of Bones
 - Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst
- 28. Diseases of Cardiovascular system
 - Cardiac failure
 - Congenital heart disease - ASD, VSD, PDA
 - Fallot's Tetralogy

- Infective Endocarditis
- Atherosclerosis
- Ischaemic heart Disease

29. Haemorrhagic Disorders

- Coagulation cascade
- Coagulation disorders
 - Platelet function
 - Platelet disorders

Practicals

1. Urine - Abnormal constituents
 - Sugar, albumin, ketone bodies
2. Urine - Abnormal constituents
 - Blood, bile salts, bile pigments
3. Haemoglobin (Hb) estimation
4. Total WBC count
5. Differential WBC Count
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
10. Histopathology slides
 - CVC lung, CVC liver, Kidney amyloidosis
11. Histopathology slides
 - Tuberculosis, Actinomycosis, Rhinosporidiosis
12. Histopathology slides
 - Papilloma, Basal cell Ca, Sq cell Ca
13. Histopathology slides
 - Osteosarcoma, osteoclastoma, fibrosarcoma
14. Histopathology slides
 - Malignant melanoma, Ameloblastoma, Adenoma
15. Histopathology slides
 - Mixed parotid tumour, metastatic carcinoma in lymph node

List of Textbooks

1. Robbins - Pathologic Basis of Disease Cotran, Kumar, Robbins
2. Anderson's Pathology Vol 1 & 2 Editors - Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematology Lee, Bithell, Foerster, Athens, Lukens

MICROBIOLOGY**AIM:**

To introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology, importance, significance and contribution of each branch to mankind and other fields of medicine. The objectives of teaching microbiology can be achieved by various teaching techniques such as :

- Lectures
- Lecture Demonstrations
- Practical exercises
- Audio visual aids
- Small group discussions with regular feed back from the students.

OBJECTIVES:**A. KNOWLEDGE AND UNDERSTANDING**

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

- Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
- 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.
- Understand and practice various methods of Sterilisation and disinfection in dental clinics.
- Have a sound understanding of various infectious diseases and lesions in the oral cavity.

A. SKILLS

- Student should have acquired the skill to diagnose, differentiate various oral lesions.
- Should be able to select, collect and transport clinical specimens to the laboratory.
- Should be able to carry out proper aseptic procedures in the dental clinic.

A brief syllabus of Microbiology is given as follows:

A. GENERAL MICROBIOLOGY:

- History, Introduction, Scope, Aims and Objectives.
- Morphology and Physiology of bacteria.
- Detail account of Sterilisation and Disinfection.
- Brief account of Culture media and Culture techniques.
- Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.
- Bacterial Genetics and Drug Resistance in bacteria.

B. IMMUNOLOGY:

- Infection - Definition, Classification, Source, Mode of transmission and types of infectious disease.
- Immunity
- Structure and functions of immune system
- The Complement System
- Antigen
- Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
- Immune response
- Antigen - Antibody reactions - with reference to clinical utility.
- Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
- Hypersensitivity reactions
- Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
- Immunology of Transplantation and Malignancy
- Immunohaematology

C. SYSTEMATIC BACTERIOLOGY:

- Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus,

- Meningococcus - brief account of each coccus - detailed account of mode of spread, laboratory diagnosis, Chemo therapy and prevention - Detailed account of Cariogenic Streptococci.
2. *Corynebacterium diphtheriae* - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
 3. Mycobacteria - Tuberculosis and Leprosy
 4. *Clostridium* - Gas gangrene, food poisoning and tetanus.
 5. Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.
 6. *Spirochaetes* - *Treponema pallidum* - detailed account of Oral Lesions of syphilis, *Borrelia vincentii*.
 7. Actinomycetes.

D. VIROLOGY:

1. Introduction
2. General properties, cultivation, host - virus interaction with special reference to Interferon.
3. Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.
4. A few viruses of relevance to dentistry.
 - Herpes Virus
 - Hepatitis B Virus - brief about other types
 - Human Immunodeficiency Virus (HIV)
 - Mumps Virus
 - Brief - Measles and Rubella Virus
5. Bacteriophage - structure and Significance

E. MYCOLOGY

1. Brief Introduction
2. Candidosis - in detail
3. Briefly on oral lesions of systemic mycoses.

F. PARASITOLOGY:

1. Brief introduction - protozoans and helminths
2. Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

RECOMMENDED BOOKS FOR REGULAR READING:

1. Text book of Microbiology - R. Ananthanarayan & C.K. Jayaram Paniker.
2. Medical Microbiology - David Greenwood et al.

BOOKS FOR FURTHER READING/REFERENCE

- i) Microbiology - Prescott, et al.
- ii) Microbiology - Bernard D. Davis, et al.
- iii) Clinical & Pathogenic Microbiology - Barbara J Howard, et al.
- iv) Mechanisms of Microbial diseases - Moselio Schaechter, et al.
- v) Immunology an Introduction - Tizard
- vi) Immunology 3rd edition - Evan Roitt, et al.

5. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

GOAL:

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

OBJECTIVES:

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

- i) Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.
- ii) List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.
- iii) Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs.

- iv) Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients.
- v) Integrate the rational drug therapy in clinical pharmacology.
- vi) Indicate the principles underlying the concepts of "Essential drugs".

SKILLS:

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

- 1) Prescribe drugs for common dental and medical ailments.
- 2) To appreciate adverse reactions and drug interactions of commonly used drugs.
- 3) Observe experiments designed for study of effects of drugs.
- 4) Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.
- 5) **INTEGRATION:** Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

LECTURE:**I. GENERAL PHARMACOLOGY:**

- 1. General principles of pharmacology; sources and nature of drugs dosage forms; prescription writing; pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effects of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions; drug interactions, Implications of General Principles in clinical dentistry.
- 2. CNS drugs; General anaesthetics, hypnotics, analgesics psychotropic drugs, anti - epileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.
- 3. Autonomic drugs; sympathomimetics, antiadrenergic drugs parasympathomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.
- 4. Cardiovascular drugs; Cardiac stimulants ; antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.
- 5. Autocoids: Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autocoids in clinical dentistry.
- 6. Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.
- 7. G.I.T. Drugs, Purgatives, anti-diarrhoeal, antacids, anti-emetics, Implications of these drugs in clinical dentistry.
- 8. Endocrines; Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.
- 9. Chemotherapy: Antimicrobial agents (against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Pharmacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of Chemotherapy in clinical dentistry.
- 10. Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit. E, Implications of Vitamins in clinical dentistry.
- 11. Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.
- 12. Chelating agents - BAL, EDTA and desferrioxamine,

II. DENTAL PHARMACOLOGY

- 1. Anti - septics, astringents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.
 - 2. Pharmacotherapy of common oral conditions in dentistry.
- Practicals and Demonstrations :**
To familiarise the student with the methodology: prescription writing and dispensing.
Rationale of drug combinations of marketed drugs.

LIST OF BOOKS RECOMMENDED FOR READING AND REFERENCE

- 1. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacotherapeutics, 10th Edition, Bombay Popular Prakashan 1991.
- 2. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997.

3. Laurence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997.
4. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part II, 13th Popular Prakashan Bombay 1993.
5. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.

6. DENTAL MATERIALS

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

INTRODUCTION

AIMS:

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

OBJECTIVES:

To understand the evolution and development of science of dental material.
To explain purpose of course in dental materials to personnels concerned with the profession of the dentistry. Knowledge of physical and chemical properties. Knowledge of biomechanical requirements of particular restorative procedure. An intelligent compromise of the conflicting as well as co-ordinating factors into the desired Ernest. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals. Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials

NEEDS FOR THE COURSE:

The profession has to rise from an art to a science, the need for the dentist to possess adequate knowledge of materials to exercise his best through knowledge of properties of different types of materials. The growing concern of health hazards due to mercury toxicity, inhalation of certain vapour or dust materials, irritations and allergic reaction to skin due to contact of materials. Materials causing irritation of oral tissues, pH of restorative materials causing inflammation and necrosis of pulp which is a cause for the dentist to possess wider knowledge of physical, chemical and biological properties of materials being used. For the protection for the patient and his own protection certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically accept.

SCOPE:

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

2). 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.

3). IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS

Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour – hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication

4). BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS.

Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility. eg. contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-affecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity. Disinfection of dental materials for infection control.

5). GYPSUM & GYPSUM PRODUCTS.

Gypsum – its origin, chemical formula, Products manufactured from gypsum.

Dental plaster, Dental stone, Die stone, high strength, high expansion stone.

Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Supplied as and Commercial names.

Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material.

Setting time: working time and setting time, Measurement of setting time and factors controlling setting time.

Setting expansion, Hygroscopic setting expansion – factors affecting each

Strength: wet strength, dry strength, factors affecting strength, tensile strength

Slurry – need and use.

Care of cast.

ADA classification of gypsum products

Description of impression plaster and dental investment

Manipulation including recent methods or advanced methods.

Disinfection : infection control, liquids, sprays, radiation

Method of use of disinfectants

Storage of material – shelf life

6) IMPRESSION MATERIALS USED IN DENTISTRY

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, Visible light cure polyether urethane dimethacrylate, Historical background & development of each impression material,

Definition of impression, Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material.

Application and their uses in different disciplines, Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting, Control of setting time, Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancements in material and mixing devices. Study of properties: 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 & disadvantages of each material.

7). SYNTHETIC RESINS USED IN DENTISTRY.

Historical background and development of material, Denture base materials and their classification and requirement

Classification of resins

Dental resins – requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co polymerization, molecular weight, crosslinking, plastixizers, Physical properties of polymers, polymer structures types of resins.

ACRYLIC RESINS:

Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.

RESTORATIVE RESINS:

Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage Classification of Composites: Application, composition and properties of each Composites of posterior teeth, Prosthodontics resins for veneering Biocompatibility – microleakage, pulpal reaction, pulpal protection Manipulation of composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system – Indirect & direct, Core build up, Orthodontic applications.

8). METAL AND ALLOYS:

Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, Constitutes or equilibrium phase diagrams: Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment. Tarnish and corrosion. Definition: causes of corrosion, protection against corrosion., Corrosion of dental restorations, clinical significance of galvanic current. Dental Amalgam.

History:

Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as.

Amalgamation : setting reaction & resulting structure , properties , Microleakage

Dimensional stability, Strength, Creep, Clinical performance

Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration., Repair of amalgam, mercury toxicity, mercury hygiene.

DIRECT FILLING GOLD:

Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material

Classification : Gold Foil, Electrolytic precipitate, powdered gold.

Manipulation: Removal of surface impurities and compaction of direct filling gold.

Physical properties of compacted gold, Clinical performance.

DENTAL CASTING ALLOYS:

Historical background, desirable properties of casting alloys.

Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures).

Classification of casting alloys: By function & description.

Recent classification, High noble (HN), Noble (N) and predominantly base metal (PB) Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal. Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion. Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment: Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application, properties & advantages. Technical considerations in casting. Heat source, furnaces.

9). DENTAL WAXES INCLUDING INLAY CASTING WAX.

Introduction and importance of waxes. Sources of natural waxes and their chemical nature.

Classification of Waxes:

Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply: Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.

Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths.

Other waxes: Applications, mode of supply & properties.

Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions, Bite registration wax.

10). DENTAL CASTING INVESTMENTS.

Definition, requirements, classification

Gypsum bonded - classification. Phosphate bonded, Silica bonded

Mode of Supply: Composition, application, setting mechanism, setting time & factors controlling.

Expansions: Setting expansion, Hygroscopic Setting expansion, & thermal expansion: factors affecting. Properties: Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure, Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.

11). SOLDERING, BRAZING AND WELDING

Need of joining dental appliances, Terms & Definition

Solders: Definition, ideal requirement, types of solders - Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties.

Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint.

Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection.

Technique of Soldering & Brazing: free hand soldering and investment, steps and procedure.

Welding: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.

WROUGHT BASE METAL ALLOYS

Applications and different alloys used mainly for orthodontics purpose

1. Stainless steel
2. Cobalt chromium nickel
3. Nickel titanium
4. Beta titanium

Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility

Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation, Mechanical properties - strength, tensile, yield strength, KHN. Braided & twisted wires their need, Solders for stainless steel, Fluxes, Welding

1. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties
2. Nickel - Titanium alloys, shape, memory & super elastic
3. Titanium alloys, application, composition, properties, welding, Corrosion resistance

12). DENTAL CEMENTS

Definition & Ideal requirements:

Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide eugenol, modified zinc oxide eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate, Cavity liners and cement bases, Varnishes Calcium hydroxide, Gutta percha

Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechanism of caries inhibition. Agents for pulpal protection., Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.

13). DENTAL CERAMICS

Historical background & General applications.

Dental ceramics : 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, esthetic properties, biocompatibility, technical considerations.

Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition.

Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.

14). 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 oxide, sand, carbides, diamond, zirconium silicate Zinc oxide

ABRASIVE ACTION :

Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed.

Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration - Material and procedure used for abrasion and polishing Electrolytic polishing and burnishing.

15). DIE AND COUNTER DIE MATERIALS INCLUDING ELECTROFORMING AND ELECTROPOLISHING.

Types - Gypsum products, Electroforming, Epoxy resin, Amalgam.

16). DENTAL IMPLANTS : Evolution of dental implants, types and materials.**17). MECHANICS OF CUTTING : Burs and points.**

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

RECOMMENDED BOOKS:

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

7. PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES

1. Identification and study of handcutting instruments chisels, gingival margin trimmers, excavators and hatchet.
2. Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)

3. Preparation class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models.
4. 10 exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.
5. Exercises on phantom head models which includes cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class II Mods	2
Class V and III for glass ionomers	4
Class V for amalgam	2
6. Polishing of above restorations.
7. Demonstration of Class III and Class V cavity preparation. For composites on extracted tooth completing the restoration.
8. Polishing and finishing of the restoration of composites.
9. Identification and manipulation of varnish bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Eugenol cements.
10. Identification and manipulation of various matrices, tooth separators and materials like composites and modified glassionomer cements.
11. Cast Restoration
 1. Preparation of Class II inlay cavity
 2. Fabrication of wax pattern
 3. Sprue for inner attachment investing
 4. Investing of wax pattern
 5. Finishing and cementing of class II inlay in extracted tooth.
12. Endodontics
 1. Identification of basic endodontic instruments
 2. Coronal access cavity preparation on extracted. Upper central incisors.
 3. Determination of working length.
 4. Biomechanical preparation of root canal space of central incisor
 5. Obfuration of root canal spaces. Absens of coronal access cavity.
 6. Closure of access cavity

8. ORAL PATHOLOGY & ORAL MICROBIOLOGY

OBJECTIVES:

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

1. The different types of pathological processes, that involve the oral cavity.
2. The manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.
3. An understanding of the oral manifestations of systemic diseases should help in correlating with the systemic physical signs & laboratory findings.
4. The student should understand the underlying biological principles governing treatment of oral diseases.
5. The principles of certain basic aspects of Forensic Odontology.

SKILLS:

1. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides.
2. Study of the disease process by surgical specimens.
3. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
4. Microscopic study of plaque pathogens.
5. Study of haematological preparations (blood films) of anaemias & leukemias.
6. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

INTRODUCTION:

1. A bird's eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic diseases to be brought out. Interrelationship between General Medicine & General Surgery & Oral pathology to be emphasized.
2. Developmental disturbances of teeth, jaws and soft tissues of oral & paraoral region :

- ♦ Introduction to developmental disturbances - Hereditary, Familial mutation, Hormonal etc. causes to be highlighted.
- ♦ Developmental disturbances of teeth - Etiopathogenesis, clinical features, radiological features & histopathological features as appropriate :-
The size, shape, number, structure & eruption of teeth & clinical significance of the anomalies to be emphasized.
- ♦ Forensic Odontology,
- ♦ Developmental disturbances of jaws - size & shape of the jaws.
- ♦ Developmental disturbances of oral & paraoral soft tissues - lip & palate - clefts, tongue, gingiva, mouth, salivary glands & face.
- 3. Dental Caries :
 - ♦ Etiopathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae.
- 4. Pulp & Periapical Pathology & Osteomyelitis.
 - ♦ Etiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions & osteomyelitis.
 - ♦ Sequelae of periapical abscess - summary of space infections, systemic complications & significance.
- 5. Periodontal Diseases :
 - ♦ Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.
- 6. Microbial infections of oral soft tissues :
 - ♦ Microbiology, defence mechanisms including immunological aspects, oral manifestations, histopathology and laboratory diagnosis of common bacterial, viral & fungal infections namely :-
Bacterial : Tuberculosis, Syphilis, ANUG & its complications - Cancrum Oris.
Viral : Herpes Simplex, Varicella zoster, Measles; Mumps & HIV infection.
Fungal : Candidal infection. Aphthous Ulcers.
- 7. Common non-inflammatory diseases involving the jaws :
 - ♦ Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of :
Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome & Down's syndrome.
- 8. Diseases of TM Joint :
 - ♦ Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.
- 9. Cysts of the Oral & Paraoral region :
 - ♦ Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts, Non-Odontogenic cysts, Pseudocysts of jaws & soft tissue cysts of oral & paraoral region.
- 10. Tumours of the Oral Cavity :
 - ♦ Classification of Odontogenic, Non-Odontogenic & Salivary Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-
 - a) Odontogenic - all lesions.
 - b) Non-odontogenic
 - Benign Epithelial - Papilloma, Keratoacanthoma & Naevi.
 - Benign Mesenchymal - Fibroma, Aggressive fibrous lesions, Lipoma, Haemangioma, Lymphangioma, Neurofibroma, Schwannoma, Chondroma, Osteoma & Tori.
 - Malignant Epithelial - Basal Cell Carcinoma, Verrucous Carcinoma, Squamous Cell carcinoma & Malignant Melanoma.
 - Malignant Mesenchymal - Fibrosarcoma, Osteosarcoma, Giant cell tumour, Chondrosarcoma, Angiosarcoma, Kaposi's sarcoma, Lymphomas, Ewing's sarcoma & Other Reticuloendothelial tumours.
 - c) Salivary Gland
 - Benign Epithelial neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma.
 - Malignant Epithelial neoplasms - Adenoid Cystic Carcinoma,

Mucoepidermoid Carcinoma,
Acinic Cell Carcinoma & Adenocarcinomas.

- d) Tumours of Disputed Origin - Congenital Epulis & Granular Cell Myoblastoma.
e) Metastatic tumours - Tumors metastasizing to & from oral cavity & the routes of metastasis.

11. Traumatic, Reactive & Regressive lesions of Oral Cavity :
 - ♦ Pyogenic & Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer & Traumatic Neuroma.
 - ♦ Attrition, Abrasion, Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth.
 - ♦ Radiation effects of oral cavity, summary of Physical & Chemical injuries including allergic reactions of the oral cavity.
 - ♦ Healing of Oral wounds & complications - Dry socket.
12. Non neoplastic Salivary Gland Diseases :
 - ♦ Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.
13. Systemic Diseases involving Oral cavity :
 - ♦ Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.
14. Mucocutaneous Lesions :
 - ♦ Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus.
15. Diseases of the Nerves :
 - ♦ Facial neuralgias - Trigeminal & Glossopharyngeal. VII nerve paralysis, Causalgia.
 - ♦ Psychogenic facial pain & Burning mouth syndrome.
16. Pigmentation of Oral & Paraoral region & Discolouration of teeth :
 - ♦ causes & clinical manifestations.
17. Diseases of Maxillary Sinus :
 - ♦ Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum.
18. a) ORAL PRECANCER - CANCER; Epidemiology, aetiology, clinical and histopathological features, TNM classification. Recent advances in management and prevention.
b) Biopsy : Types of biopsy, value of biopsy, cytology, histo chemistry & frozen sections in diagnosis of oral diseases.
19. Principles of Basic Forensic Odontology (Pre-clinical Forensic Odontology):
 - ♦ Introduction, definition, aims & scope.
 - ♦ Sex and ethnic (racial) differences in tooth morphology and histological age estimation
 - ♦ Determination of sex & blood groups from buccal mucosa / saliva.
 - ♦ Dental DNA methods
 - ♦ Bite marks, rugae patterns & lip prints.
 - ♦ Dental importance of poisons and corrosives.
 - ♦ Overview of forensic medicine and toxicology

RECOMMENDED BOOKS

1. A Text Book of Oral Pathology
2. Oral Pathology - Clinical Pathologic correlations
3. Oral Pathology
4. Oral Pathology in the Tropics

- Shafer, Hine & Levy.
- Regezi & Sciubba.
- Soames & Southam.
- Prabhu, Wilson, Johnson & Daftary

9. GENERAL MEDICINE

GUIDELINES:

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

1. Special precautions/ contraindication of anaesthesia and various dental procedures in different systemic diseases.
2. Oral manifestations of systemic diseases.
3. Medical emergencies in dental practice.

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

THEORY SYLLABUS

CORE TOPICS

(Must Know)

1. Aims of medicine Definitions of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis.

2. Infections.

Enteric fever, AIDS, herpes simplex, herpes zoster, syphilis diphtheria.

3. G.I.T.

Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites.

4. CVS

Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, infective endocarditis, common arrhythmias, congenital heart disease, congestive cardiac failure.

5. RS

Pneumonia, COPD, Pulmonary TB, Bronchial asthma

6. Hematology

Anemias, bleeding & clotting disorders, leukemias, lymphomas, agranulocytosis, splenomegaly, oral manifestations of hematologic disorders, generalized

Lymphadenopathy.

7. Renal System

Acute nephritis
Nephrotic syndrome

8. Nutrition

Avitaminosis

9. CNS

Facial palsy, facial pain including trigeminal neuralgia, epilepsy, headache including migraine.

10. Endocrines

Diabetes Mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids.

11. Critical care

Syncope, cardiac arrest, CPR, shock

COLLATERAL TOPICS

(Desirable to Know)

Infectious mononucleosis mumps, measles, rubella, malaria.

Diarrhea

Dysentery

Amoebiasis

Malabsorption

Lung Abscess

Pleural effusion

Pneumothorax

Bronchiectasis

Lung cancers.

Renal failure

Balanced diet

PEM

Avitaminosis

- Meningitis

- Examination of comatose patient

- Examination of cranial nerves.

Addison's disease, Cushing's syndrome.

Ac LVF

ARDS

CLINICAL TRAINING:

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

10. GENERAL SURGERY

AIMS:

To acquaint the student with various diseases, which may require surgical expertise and to train the student to analyze the history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance,

at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

1. **HISTORY OF SURGERY:**

The development of surgery as a speciality over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialities in the practice of modern surgery.

2. **GENERAL PRINCIPLES OF SURGERY:**

Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.

3. **WOUNDS:**

Their classification, wound healing, repair, treatment of wounds, medico-legal aspects of accidental wounds and complications of wounds.

4. **INFLAMMATION:**

Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.

5. **INFECTIONS:**

Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysipelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxemia and septicemia.

6. **TRANSMISSIBLE VIRAL INFECTIONS:**

HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.

7. **SHOCK AND HAEMORRHAGE:**

Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage - different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.

8. **TUMOURS, ULCERS, CYSTS, SINUS AND FISTULAE:**

Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae.

9. **DISEASES OF LYMPHATIC SYSTEM:**

Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.

10. **DISEASES OF THE ORAL CAVITY:**

Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.

11. **DISEASES OF LARYNX, NASOPHARYNX:**

Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.

12. **NERVOUS SYSTEM:**

Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve and its management. Trigeminal neuralgia, its presentation and treatment.

13. FRACTURES:

General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.

14. PRINCIPLES OF OPERATIVE SURGERY:

Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.

15. ANOMOLIES OF DEVELOPMENT OF FACE:

Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.

16. DISEASES OF THYROID AND PARATHYROID:

Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.

17. SWELLINGS OF THE JAW:

Differential diagnosis and management of different types of swellings of the jaw.

18. BIOPSY:

Different types of biopsies routinely used in surgical practice.

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

11. CONSERVATIVE DENTISTRY AND ENDODONTICS**OBJECTIVES:**

- A. Knowledge and understanding
- B. Skills and
- C. Attitudes

A). Knowledge and understanding:

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

- i. To diagnose and treat simple restorative work for teeth.
- ii. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.
- iii. To gain the knowledge about endodontic treatment on the basis of scientific foundation.
- iv. To carry out simple endodontic treatment.
- v. To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

SKILLS:

He should attain following skills necessary for practice of dentistry

- i) To use medium and high speed hand pieces to carry out restorative work.
- ii) Posses the skills to use and familiarise endodontic instruments and materials needed for carrying out simple endodontic treatment.
- iii) To achieve the skills to translate patients esthetic needs along with function.

ATTITUDES:

- i). Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
- ii). Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.
- iii). To help and participate in the implementation of the national oral health policy.
- iv). He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

INTRODUCTION :

Definition aims objectives of Conservative Dentistry scope and future of Conservative Dentistry.

1. Nomenclature Of Dentition:
Tooth numbering systems A.D.A. Zsigmondy Palmer and F.D.I. systems.
2. Principles Of Cavity Preparation
Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors angles of cavities.
3. Dental Caries :
Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries.
4. Treatment Planning For Operative Dentistry:
Detailed clinical examination, radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet.
5. Gnathological Concepts Of Restoration:
Physiology of occlusion, normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.
6. Armamentarium For Cavity Preparation:
General classification of operative instruments, Hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilisation and maintenance of instruments. Basic instrument tray set up.
7. Control of Operating Field:
Light source sterilisation field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialagogues.
8. Amalgam Restoration :
Indication contraindication, physical and mechanical properties, clinical behaviour. Cavity preparation for Class I, II, V and III. Step wise procedure for cavity preparation and restoration. Failure of amalgam restoration.
9. Pulp Protection:
Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glass ionomer cements.
10. Anterior Restorations :
Selection of cases, selection of material, step wise procedures for using restorations, silicate (theory only) glass ionomers, composites, including sand witch restorations and bevels of the same with a note on status of the dentine bonding agents.
11. Direct Filling Gold Restorations :
Types of direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.
12. Preventive Measures In Restorative Practice :
Plaque Control, Pit and fissure sealants dietary measures restorative procedure and periodontal health. Contact and contour of teeth and restorations matrices tooth separation and wedges.
13. Temporisation or Interim Restoration.
14. Pin Amalgam Restoration Indication Contra Indication :
Advantages disadvantages of each types of pin methods of placement use of auto matrix. Failure of pin amalgam restoration.
15. Management Of Deep Carious Lesions Indirect And Direct Pulp Capping.
16. Non Carious Destruction's Tooth Structures Diagnosis and Clinical Management
17. Hyper Sensitive Dentine And Its Management.
18. Cast Restorations
Indications, contra indications, advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays fabrication of wax pattern spruing inverting and casting procedures & casting defects.
19. Die Materials And Preparation Of Dies.
20. Gingival Tissue Management For Cast Restoration And Impression Procedures
21. Recent Cavity Modification Amalgam Restoration.
22. Differences between Amalgam And Inlay Cavity preparation with note on all the types of Bawels used for Cast Restoration.
23. Control Of Pain During Operative Procedures.
24. Treatment Planning For Operative Dentistry Detailed Clinical Examination Radiographic Examination
25. Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet.

26. Applied Dental Materials.
 1. Biological Considerations.
Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide eugenol cements zinc phosphate cements, polycarboxylates glass ionomer cements, silicate cement calcium hydroxides varnishes.
 2. Dental amalgam, technical considerations mercury toxicity mercury hygiene.
 3. Composite, Dentine bonding agents, chemical and light curing composites
 4. Rubber base Imp. Materials
 5. Nobel metal alloys & non noble metal alloys
 6. Investment and die materials
 7. Inlay casting waxes
 8. Dental porcelain
 9. Aesthetic Dentistry
27. Endodontics: introduction definition scope and future of endodontics
28. Clinical diagnostic methods
29. Emergency endodontic procedures
30. Pulpal diseases causes, types and treatment .
31. Periapical diseases: acute periapical abscess, acute periodontal abscess phoeix abscess, chronic alveolar abscess granuloma cysts condensing osteitis, external resorption.
32. Vital pulp therapy: indirect and direct pulp capping pulpotomy different types and medicaments used.
33. Apexogenesis and apexification or problems of open apex.
34. Rationale of endodontic treatment case selection indication and contraindications for root canal treatments.
35. Principles of root canal treatment mouth preparation root canal instruments, hand instruments, power driven instruments, standardisation color coding principle of using endodontic instruments. Sterilisation of root canal instruments and materials rubber dam application.
36. Anatomy of the pulp cavity: root canals apical foramen. Anomalies of pulp cavities access cavity preparation of anterior and premolar teeth.
37. Preparation of root canal space : Determination of working length, cleaning and shaping of root canals, irrigating solution chemical-aids to instrumentation.
38. Disinfection of root canal space intracanal medicaments, poly antibiotic paste ross mans paste, mummifying agents. Out line of root canal treatment, bacteriological examinations, culture methods.
39. Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of single and double curved root canals.
40. Methods of cleaning and shaping like step back crown down and conventional methods.
41. Obturation of the root canal system. Requirements of an ideal root canal filling material obturation methods using gutta percha healing after endodontic treatment. Failures in endodontics.
42. Root canal sealers. Ideal properties classification. Manipulation of root canal sealers.
43. post endodontic restoration fabrication and components of post core preparation.
44. smear layer and its importance in endodontics and conservative treatment.
45. discoloured teeth and its management. Bleaching agents, vital and non vital bleaching methods.
46. traumatised teeth classification of fractured teeth. Management of fractured tooth and root. Luxated teeth and its management.
47. endodontic surgeries indication contraindications, pre operative preparation. Pre medication surgical instruments and techniques apicectomy, retrograde filling, post operative sequelae terphination hemisection, radiscetomy techniques of tooth reimplantation (both intentional and accidental) endodontic implants.
48. root resorption.
49. emergency endodontic procedures.
50. lasers in conservative endodontics (introduction only) practice management
51. professional association dentist act 1948 and its amendment 1993.
52. duties towards the govt. Like payments of professional tax, income tax.
53. financial management of practice

54. dental material and basic equipment management.

55. Ethics

12. ORAL & MAXILLOFACIAL SURGERY

AIMS:

To produce a graduate who is competent in performing extraction of teeth under both local and general anaesthesia, prevent and manage related complications, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems.

OBJECTIVES:

a) Knowledge & Understanding:

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

1. Able to apply the knowledge gained in the related medical subjects like pathology, microbiology and general medicine in the management of patients with oral surgical problem.
2. Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
3. Knowledge of range of surgical treatments.
4. Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.
5. Understand the principles of in-patient management.
6. Understanding of the management of major oral surgical procedures and principles involved in patient management.
7. Should know ethical issues and communication ability.

b) Skills:

1. A graduate should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner. Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.
2. Should be competent in the extraction of teeth under both local and general anaesthesia.
3. Should be able to carry out certain minor oral surgical procedures under L.A. like frenectomy, alveolar procedures & biopsy etc.
4. Ability to assess, prevent and manage various complications during and after surgery.
5. Able to provide primary care and manage medical emergencies in the dental office.
6. Understanding of the management of major oral surgical problems and principles involved in inpatient management.

DETAILED SYLLABUS

1. Introduction, definition, scope, aims and objectives.
2. Diagnosis in oral surgery:
 - (A) History taking
 - (B) Clinical examination
 - (C) Investigations.
3. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.
4. Principles of Oral Surgery -
 - a) Asepsis: Definition, measures to prevent introduction of infection during surgery.
 1. Preparation of the patient
 2. Measures to be taken by operator
 3. Sterilisation of instruments - various methods of sterilisation etc.
 4. Surgery set up.
 - b) Painless Surgery:
 1. Pre-anaesthetic considerations. Pre-medication: purpose, drugs used
 2. Anaesthetic considerations -
 - a) Local b) Local with IV sedations
 3. Use of general anaesthetic
 - c) Access:
 - Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.
 - Bone Removal: Methods of bone removal.
 - Use of Burs: Advantages & precautions
 - Bone cutting instruments: Principles of using chisel & osteotome.

- Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.
- Submandibular
 - Pre auricular
 - Incision to expose maxilla & orbit
 - Bicoronal incision
- d) Control of haemorrhage during surgery
- Normal Haemostasis
- Local measures available to control bleeding
- Hypotensive anaesthesia etc.
- e) Drainage & Debridement
- Purpose of drainage in surgical wounds
- Types of drains used
- Debridement: purpose, soft tissue & bone debridement
- f) Closure of wounds
- Suturing: Principles, suture material, classification, body response to various materials etc.
- g) Post operative care
- Post operative instructions
- Physiology of cold and heat
- Control of pain - analgesics
- Control of infection - antibiotics
- Control of swelling - anti-inflammatory drugs
- Long term post operative follow up - significance.
5. Exodontia: General considerations
- Ideal Extraction.
- Indications for extraction of teeth
- Extractions in medically compromised patients.
- Methods of extraction
- (a) Forceps or intra-alveolar or closed method.
- Principles, types of movement, force etc.
- (b) Trans-alveolar, surgical or open method, indications, surgical procedure
- Dental elevators: uses, classification, principles in the use of elevators, commonly used elevators.
- Complications of Exodontia
- Complications during exodontia
- Common to both maxilla and mandible
- Post-operative complications -
- Prevention and management of complications
6. Impacted teeth:
- Incidence, definition, aetiology.
- (a) Impacted mandibular third molar.
- Classification, reasons for removal,
- Assessment - both clinical & radiological
- Surgical procedures for removal
- Complications during and after removal,
- Prevention and management.
- (b) Maxillary third molar,
- Indications for removal, classification,
- Surgical procedure for removal.
- (c) Impacted maxillary canine
- Reasons for canine impaction,
- Localization, indications for removal,
- Methods of management; labial and palatal approach,
- Surgical exposure, transplantation, removal etc.
7. Pre-prosthetic Surgery:
- Definition, classification of procedures
- (a) Corrective procedures: Alveoloplasty,
- Reduction of maxillary tuberosities,
- Frenectomies and removal of tori.
- (b) Ridge extension or Sulcus extension procedures

- Indications and various surgical procedures.
- (c) Ridge augmentation and reconstruction
 Indications, use of bone grafts, Hydroxyapatite
 Implants - concept of osseointegration
 Knowledge of various types of implants and
 surgical procedure to place implants.
8. Diseases of the maxillary sinus
 Surgical anatomy of the sinus.
 Sinusitis both acute and chronic
 Surgical approach of sinus - Caldwell-Luc procedure
 Removal of root from the sinus.
 Oro-antral fistula - aetiology, clinical features and various surgical
 methods for closure.
9. Disorders of T.M. Joint
 Applied surgical anatomy of the joint.
 Dislocation - Types, aetiology, clinical features and management.
 Ankylosis - Definition, aetiology, clinical features and management.
 Myo-facial pain dysfunction syndrome, aetiology, clinical features, management -
 Non surgical and surgical.
 Internal derangement of the joint.
 Arthritis of T.M. Joint.
10. Infections of the Oral cavity
 Introduction, factors responsible for infection, course of odontogenic
 infections, spread of odontogenic infections through various facial spaces.
 Dento-alveolar abscess - aetiology, clinical features and management.
 Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors,
 classification, clinical features and management.
 Ludwig's angina - definition, aetiology, clinical features, management and
 complications.
11. Benign cystic lesions of the jaws
 Definition, classification, pathogenesis.
 Diagnosis - Clinical features, radiological, aspiration biopsy, use of contrast
 media and histopathology.
 Management - Types of surgical procedures, Rationale of the techniques,
 indications, procedures, complications etc.
12. Tumours of the Oral cavity -
 General considerations
 Non odontogenic benign tumours occurring in oral cavity - fibroma, papilloma,
 lipoma, ossifying fibroma, myxoma etc.
 Ameloblastoma - Clinical features, radiological appearance and methods of
 management.
 Carcinoma of the oral cavity
 Biopsy - types
 TNM classification.
 Outline of management of squamous
 Cell carcinoma: surgery, radiation and chemotherapy
 Role of dental surgeons in the prevention and early detection of oral cancer.
13. Fractures of the jaws -
 General considerations, types of fractures, aetiology, clinical features and: general
 principles of management.
 mandibular fractures - Applied anatomy, classification.
 Diagnosis - Clinical and radiological
 Management - Reduction closed and open
 Fixation and immobilisation methods.
 Outline of rigid and semi-rigid internal fixation.
 Fractures of the condyle - aetiology, classification, clinical features, principles
 of management.
 Fractures of the middle third of the face.
 Definition of the mid face, applied surgical anatomy, classification, clinical
 features and outline of management.
 Alveolar fractures - methods of management

- Fractures of the Zygomatic complex
 Classification, clinical features, indications for treatment, various methods of reduction and fixation.
 Complications of fractures - delayed union, non-union and malunion.
14. Salivary gland diseases -
 Diagnosis of salivary gland diseases
 Sialography, contrast media, procedure.
 Infections of the salivary glands
 Sialolithiasis - Sub mandibular duct and gland and parotid duct.
 Clinical features, management.
 Salivary fistulae
 Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.
15. Jaw deformities -
 Basic forms - Prognathism, Retrognathism and open bite.
 Reasons for correction.
 Outline of surgical methods carried out on mandible and maxilla.
16. Neurological disorders -
 Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical.
 Facial paralysis - Aetiology, clinical features.
 Nerve injuries - Classification, neurohaphy etc.
17. Cleft Lip and Palate -
 Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients. Outline of the closure procedures.
18. Medical Emergencies in dental practice -
 Primary care of medical emergencies in dental practice particularly -
 (a) Cardio vascular (b) Respiratory (c) Endocrine
 (d) Anaphylactic reaction (e) Epilepsy (f) Epilepsy
19. Emergency drugs & Intra muscular I.V. Injections -
 Applied anatomy, Ideal location for giving these injections, techniques etc.
20. Oral Implantology
21. Ethics

LOCAL ANAESTHESIA:

Introduction, concept of L.A., classification of local anaesthetic agents, ideal requirements, mode of action, types of local anaesthesia, complications.

- Use of Vaso constrictors in local anaesthetic solution -
 Advantages, contra-indications, various vaso constrictors used.
 Anaesthesia of the mandible -
 Pterygomandibular space - boundaries, contents etc.
 Inferior Dental Nerve Block - various techniques
 Complications
 Mental foramen nerve block
 Anaesthesia of Maxilla -
 Intra - orbital nerve block.
 Posterior superior alveolar nerve block
 Maxillary nerve block - techniques.

GENERAL ANAESTHESIA -

- Concept of general anaesthesia.
 Indications of general anaesthesia in dentistry.
 Pre-anaesthetic evaluation of the patient.
 Pre-anaesthetic medication - advantages, drugs used.
 Commonly used anaesthetic agents.
 Complication during and after G.A.
 I.V. sedation with Diazepam and Medazolam.
 Indications, mode of action, technique etc.
 Cardiopulmonary resuscitation
 Use of oxygen and emergency drugs.
 Tracheostomy.

RECOMMENDED BOOKS:

1. Impacted teeth; Alling John F & etal.
2. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson LJ & etal.
3. Text book of oral and maxillofacial surgery; Srinivasan B.
4. Handbook of medical emergencies in the dental office, Malamed SF.
5. Killeys Fractures of the mandible; Banks P.
6. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
7. The maxillary sinus and its dental implications; McGovanda
8. Killey and Kays outline of oral surgery – Part-1; Seward GR & etal
9. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
10. Oral & maxillofacial surgery, Vol 2; Laskin DM
11. Extraction of teeth; Howe, GL
12. Minor Oral Surgery; Howe, GL
13. Contemporary oral and maxillofacial surgery; Peterson I.J. & EA
14. Oral and maxillofacial infections; Topazian RG & Goldberg MH

13. ORAL MEDICINE AND RADIOLOGY**AIMS:**

- (1) To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.
 - (2) To train the students about the importance, role, use and techniques of radiographs/digital radiograph and other imaging methods in diagnosis.
 - (3) The principles of the clinical and radiographic aspects of Forensic Odontology.
- The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.
 (I) Diagnosis, Diagnostic methods and Oral Medicine (II) Oral Radiology. Again the part ONE is subdivided into three sections. (A) Diagnostic methods (B) Diagnosis and differential diagnosis (C) Oral Medicine & Therapeutics.

COURSE CONTENT

- (1) Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.
- (2) To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

Part-I ORAL MEDICINE AND DIAGNOSTIC AIDS**SECTION (A) – DIAGNOSTIC METHODS.**

- (1) Definition and importance of Diagnosis and various types of diagnosis
- (2) Method of clinical examinations.
 - (a) General Physical examination by inspection.
 - (b) Oro-facial region by inspection, palpation and other means
 - (c) To train the students about the importance, role, use of saliva and techniques of diagnosis of saliva as part of oral disease
 - (d) Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growths pigmented lesions, white and red patches
 - (e) Examination of lymph nodes
 - (f) Forensic examination – Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification jurisprudence and ethics.
- (3) Investigations
 - (a) Biopsy and exfoliative cytology
 - (b) Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis

SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS

While learning the following chapters, emphasis shall be given only on diagnostic aspect including differential diagnosis

- (1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth
- (2) Diseases of bone and Osteodystrophies: Development disorders: Anomalies, Exostoses and tori, infantile cortical hyperostosis, osteogenesis imperfecta, Marfan's syndrome

osteopetrosis. Inflammation - Injury, infection and spread of infection, fascial space infections, osteoradionecrosis.

Metabolic disorders - Histiocytosis

Endocrine - Acro-megaly and hyperparathyroidism

Miscellaneous - Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism.

- (3) Temporomandibular joint: Developmental abnormalities of the condyle, Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation.

- (4) Common cysts and Tumors:
CYSTS: Cysts of soft tissue: Mucocoele and Ranula
Cysts of bone: Odontogenic and nonodontogenic.

TUMORS:

Soft Tissue:

Epithelial: Papilloma, Carcinoma, Melanoma

Connective tissue: Fibroma, Lipoma, Fibrosarcoma

Vascular: Haemangioma, Lymphangioma

Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis

Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumor, Adenoid cystic carcinoma.

Hard Tissue:

Non-Odontogenic: Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chondrosarcoma, Central giant cell tumor, and Central haemangioma

Odontogenic: Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor, Adenomatoid Odontogenic tumor, Periapical cemental dysplasia and odontomas

(5) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma

(6) Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn's Disease and Histiocytosis X

(7) Miscellaneous Disorders: Burkitt lymphoma, sturge Weber syndrome, CREST syndrome, rendu-osler-weber disease

SECTION (C): ORAL MEDICINE AND THERAPEUTICS

The following chapters shall be studied in detail including the etiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention

- (1) Infections of oral and paraoral structures:

Bacterial: Streptococcal, tuberculosis, syphilis, vincent's, leprosy, actinomycosis, diphtheria and tetanus

Fungal: Candida albicans

Virus: Herpes simplex, herpes zoster, ramsay hunt syndrome, measles, herpangina, mumps, infectious mononucleosis, AIDS and hepatitis-B

- (2) Important common mucosal lesions:

White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, lichenplanus, discoid lupus erythematosus

Veiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme

Ulcers: Acute and chronic ulcers

Pigmented lesions: Exogenous and endogenous

Red lesions: Erythroplakia, stomatitis venenata and medioamentosa, erosive lesions and denture sore mouth

- (3) Cervico-facial lymphadenopathy

- (4) Facial pain:

(i) Organic pain: Pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.

(ii) Pain arising due to C.N.S. diseases:

(a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, trotter's syndrome etc.)

(b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain

(iii) Referred pain: Pain arising from distant tissues like heart, spine etc.

- (5) Altered sensations: Cacogeusia, halitosis

- (6) Tongue in local and systemic disorders: (Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)
- (7) Oral manifestations of:
- (i) Metabolic disorders:
 - (a) Porphyria
 - (b) Haemochromatosis
 - (c) Histocytosis X diseases
 - (ii) Endocrine disorders:
 - (a) Pituitary: Gigantism, acromegaly, hypopituitarism
 - (b) Adrenal cortex: Addison's disease (Hypofunction) Cushing's syndrome (Hyperfunction)
 - (c) Parathyroid glands: Hyperparathyroidism.
 - (d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema
 - (e) Pancreas: Diabetes
 - (iii) Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin B12, Vitamin C (Scurvy)
 - (iv) Blood disorders:
 - (a) Red blood cell diseases
 - Deficiency anemias: (Iron deficiency, plummer - vinson syndrome, pernicious anemia)
 - Haemolytic anemias: (Thalassemia, sickle cell anemia, erythroblastosis fetalis)
 - Aplastic anemia
 - Polycythemia
 - (b) White Blood cell diseases
 - Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononucleosis and leukemias
 - (c) Haemorrhagic disorders:
 - Thrombocytopenia, purpura, hemophillia, christmas disease and von willebrand's disease
- (8) Disease of salivary glands:
- (i) Development disturbances: Aplasia, atresia and aberration
 - (ii) Functional disturbances: Xerostomia, ptyalism
 - (iii) Inflammatory conditions: Nonspecific sialadenitis, mumps, sarcoidosis Heerfordt's syndrome (Uveoparotid fever), Necrotising sialometaplasia
 - (iv) Cysts and tumors: Mucocoele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma
 - (v) Miscellaneous: Sialolithiasis, sjogren's syndrome, mikuliez's disease and sialosis
- (9) Dermatological diseases with oral manifestations:
- (a) Ectodermal dysplasia (b) Hyperkeratosis palmarplantaris with periodontopathy (c) Scleroderma (d) Lichen planus including ginspan's syndrome (e) Lupus erythematosus (f) Pemphigus (g) Erythema multiforme (h) Psoriasis
- (10) Immunological diseases with oral manifestations
- (a) Leukemia (b) Lymphomas (c) Multiple myeloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombocytopenia (f) Lupus erythematosus (g) Scleroderma (h) dermatomyositis (i) Submucous fibrosis (j) Rheumatoid arthritis (k) Recurrent oral ulcerations including behcet's syndrome and reiter's syndrome
- (11) Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)
- (12) Foci of oral infection and their ill effects on general health
- (13) Management of dental problems in medically compromised persons:
- (i) Physiological changes: Puberty, pregnancy and menopause
 - (ii) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.
- (14) Precancerous lesions and conditions
- (15) Nerve and muscle diseases:
- (i) Nerves: (a) Neuropraxia (b) Neurotmesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkerson Rosenthal syndrome and ramsay hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey's syndrome

- (ii) Muscles: (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Trismus
- (16) Forensic odontology:
- Medicolegal aspects of orofacial injuries
 - Identification of bite marks
 - Determination of age and sex
 - Identification of cadavers by dental appliances, Restorations and tissue remnants
- (17) Therapeutics: General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demulcents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy

Part - II BEHAVIOURAL SCIENCES AND ETHICS.

Part - III ORAL RADIOLOGY

- Scope of the subject and history of origin
- Physics of radiation: (a) Nature and types of radiations (b) Source of radiations (c) Production of X-rays (d) Properties of X-rays (e) Compton effect (f) Photoelectric effect (g) Radiation measuring units
- Biological effects of radiation
- Radiation safety and protection measures
- Principles of image production
- Radiographic techniques:
 - Intra-Oral: (a) Periapical radiographs (Bisecting and parallel techniques) (b) Bite wing radiographs (c) Occlusal radiographs
 - Extra-oral: (a) Lateral projections of skull and jaw bones and paranasal sinuses (c) Cephalograms (d) Orthopantomograph (e) Projections of temporomandibular joint and condyle of mandible (f) Projections for Zygomatic arches
 - Specialised techniques: (a) Sialography (b) Xeroradiography (c) Tomography
- Factors in production of good radiographs:
 - K.V.P. and mA. of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing
- Radiographic normal anatomical landmarks
- Facility radiographs and artefacts in radiographs
- Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues
- Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy
- Contrast radiography and basic knowledge of radio-active isotopes
- Radiography in Forensic Odontology - Radiographic age estimation and post-mortem radiographic methods

PRACTICALS / CLINICALS:

- Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of the orofacial region. Training is also imparted in management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic procedures and interpretation of radiographs.
- In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination
- The following is the minimum of prescribed work for recording
 - Recording of detailed case histories of interesting cases 10
 - Intra-oral radiographs (Periapical, bitewing, occlusal) 25
 - Saliva diagnostic check as routine procedure

BOOKS RECOMMENDED:

- Oral Diagnosis, Oral Medicine & Oral Pathology
- Burkit - Oral Medicine - J.B. Lippincott Company
- Coleman - Principles of Oral Diagnosis - Mosby Year Book
- Jones - Oral Manifestations of Systemic Diseases - W.B. Saunders company
- Mitchell - Oral Diagnosis & Oral Medicine
- Kerr - Oral Diagnosis
- Miller - Oral Diagnosis & Treatment

7. Hutchinson – clinical Methods
8. Oral Pathology – Shafers
9. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine
- b) Oral Radiology
1. White & Goaz – Oral Radiology – Mosby year Book
2. Weahrman – Dental Radiology – C.V. Mosby Company
3. Stafne – Oral Roentgenographic Diagnosis – W.B.Saunders Co.,

c) Forensic Odontology

1. Derek H.Clark – Practical Forensic Odontology - Butterworth-Heinemann (1992)
- 2.C Michael Bowers, Gary Bell – Manual of Forensic Odontology - Forensic Pr (1995)

14. ORTHODONTICS & DENTAL ORTHOPAEDICS

COURSE OBJECTIVE:

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyse and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures. The following basic instructional procedures will be adapted to achieve the above objectives.

1. Introduction, Definition, Historical Background, Aims And Objectives Of Orthodontics And Need For Orthodontics Care..
2. Growth And Development: In General
 - a. Definition
 - b. Growth spurts and Differential growth
 - c. Factors influencing growth and Development
 - d. Methods of measuring growth
 - e. Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovics, Multifactorial)
 - f. Genetic and epigenetic factors in growth
 - g. Cephalocaudal gradient in growth.
3. Morphologic Development Of Craniofacial Structures
 - a. Methods of bone growth
 - b. Prenatal growth of craniofacial structures
 - c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion.
4. Functional Development Of Dental Arches And Occlusion
 - a. Factors influencing functional development of dental arches and occlusion.
 - b. Forces of occlusion
 - c. Wolfe's law of transformation of bone
 - d. Trajectories of forces
5. Clinical Application Of Growth And Development
6. Malocclusion - In General
 - a. Concept of normal occlusion
 - b. Definition of malocclusion
 - c. Description of different types of dental, skeletal and functional malocclusion.
7. Classification of Malocclusion

Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.
8. Normal And Abnormal Function Of Stomatognathic System
9. Etiology Of Malocclusion
 - a. Definition, importance, classification, local and general etiological factors.
 - b. Etiology of following different types of malocclusion:
 - 1) Midline diastema
 - 2) Spacing
 - 3) Crowding
 - 4) Cross-Bite: Anterior/Posterior
 - 5) Class III Malocclusion
 - 6) Class II Malocclusion
 - 7) Deep Bite
 - 8) Open bite
10. Diagnosis And Diagnostic Aids
 - a. Definition, Importance and classification of diagnostic aids
 - b. Importance of case history and clinical examination in orthodontics

- c. Study Models: - Importance and uses - Preparation and preservation of study models
- d. Importance of intraoral X-rays in orthodontics
- e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses
- f. Cephalometrics: Its advantages, disadvantages
 - 1. Definition
 - 2. Description and use of cephalostat
 - 3. Description and uses of anatomical landmarks lines and angles used in cephalometric analysis
 - 4. Analysis- Steiner's, Down's, Tweed's, Ricket's-E- line
 - g. Electromyography and its uses in orthodontics
 - h. Wrist X-rays and its importance in orthodontics
- 11. General Principles In Orthodontic Treatment Planning Of Dental And Skeletal Malocclusions
- 12. Anchorage In Orthodontics - Definition, Classification, Types and Stability Of Anchorage
- 13. Biomechanical Principles In Orthodontic Tooth Movement
 - a. Different types of tooth movements
 - b. Tissue response to orthodontic force application
 - c. Age factor in orthodontic tooth movement
- 14. Preventive Orthodontics
 - a. Definition
 - b. Different procedures undertaken in preventive orthodontics and their limitations.
- 15. Interceptive Orthodontics
 - a. Definition
 - b. Different procedures undertaken in interceptive orthodontics
 - c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages.
 - d. Role of muscle exercises as an interceptive procedure
- 16. Corrective Orthodontics
 - a. Definition, factors to be considered during treatment planning.
 - b. Model analysis: Pont's, Ashley Howe's, Bolton, Careys, Moyer's Mixed Dentition Analysis
 - c. Methods of gaining space in the arch:- Indications, relative merits and demerits of proximal stripping, arch expansion and extractions
 - d. Extractions in Orthodontics - indications and selection of teeth for extraction.
- 17. Orthodontic Appliances: General
 - a. Requisites for orthodontic appliances
 - b. Classification, indications of Removable and Functional Appliances
 - c. Methods of force application
 - d. Materials used in construction of various orthodontic appliances - uses of stainless steel, technical considerations in curing of acrylic, Principles of welding and soldering, fluxes and antiluxes.
 - e. Preliminary knowledge of acid etching and direct bonding.
- 18. Ethics

REMOVABLE ORTHODONTIC APPLIANCES

- 1) Components of removable appliances
- 2) Different types of clasps and their uses
- 3) Different types of labial bows and their uses
- 4) Different types of springs and their uses
- 5) Expansion appliances in orthodontics:
 - i) Principles
 - ii) Indications for arch expansion
 - iii) Description of expansion appliances and different types of expansion devices and their uses.
 - iv) Rapid maxillary expansion

FIXED ORTHODONTIC APPLIANCES

- 1. Definition, Indications & Contraindications
- 2. Component parts and their uses
- 3. Basic principles of different techniques: Edgewise, Begg's, straight wire.

EXTRAORAL APPLIANCES

1. Headgears
2. chin cup
3. reverse pull headgears

MYOFUNCTIONAL APPLIANCES

1. Definition and principles
2. Muscle exercises and their uses in orthodontics
3. Functional appliances:
 - i) Activator, Oral screens, Frankels function regulator, bionator twin blocks, lip bumper
 - ii) Inclined planes - upper and lower
18. Orthodontic Management Of Cleft Lip And Palate
19. Principles Of Surgical Orthodontics
Brief knowledge of correction of:
 - a. Mandibular Prognathism and Retrognathism
 - b. Maxillary Prognathism and Retrognathism
 - c. Anterior open bite and deep bite
 - d. Cross bite
20. Principle, Differential Diagnosis & Methods Of Treatment Of:
 1. Midline diastema
 2. Cross bite
 3. Open bite
 4. Deep bite
 5. Spacing
 6. Crowding
 7. Class II - Division 1, Division 2
 8. Class III Malocclusion - True and Psuedo Class III
21. Retention And Relapse
Definition, Need for retention, Causes of relapse, Methods of retention, Different types of retention devices, Duration of retention, Theories of retention.

**CLINICALS AND PRACTICALS IN ORTHODONTICS
PRACTICAL TRAINING DURING II YEAR B.D.S.**

- I. Basic wire bending exercises Gauge 22 or 0.7mm
 1. Straightening of wires (4 Nos.)
 2. Bending of a equilateral triangle
 3. Bending of a rectangle
 4. Bending of a square
 5. Bending of a circle
 6. Bending of U.V.
- II. Construction of Clasps (Both sides upper/lower) Gauge 22 or 0.7mm
 1. 3/4 Clasp (C-Clasp)
 2. Full Clasp (Jackson's Crib)
 3. Adam's Clasp
 4. Triangular Clasp
- III. Construction of Springs (on upper both sides) Gauge 24 or 0.5mm
 1. Finger Spring
 2. Single Cantelever Spring
 3. Double Cantelever Spring (Z-Spring)
 4. T-Springs on premolars
- IV. Construction of Canine retractors Gauge 23 or 0.6mm
 1. U - Loop canine retractor
(Both sides on upper & lower)
 2. Helical canine retractor
(Both sides on upper & lower)
 3. Buccal canine retractor:
 - Self supported buccal canine retractor with
 - a) Sleeve - 5mm wire or 24 gauge
 - b) Sleeve - 19 gauge needle on any one side.
 4. Palatal canine retractor on upper both sides

Gauge 23 or 0.6mm

V. Labial Bow

Gauge 22 or 0.7mm

One on both upper and lower

CLINICAL TRAINING DURING III YEAR B.D.S.

NO. EXERCISE

01. Making upper Alginate impression
02. Making lower Alginate impression
03. Study Model preparation
04. Model Analysis
 - a. Pont's Analysis
 - b. Ashley Howe's Analysis
 - c. Carey's Analysis
 - d. Bolton's Analysis
 - e. Moyer's Mixed Dentition Analysis

CLINICAL TRAINING DURING FINAL YEAR B.D.S.

NO. EXERCISE

01. Case History taking
02. Case discussion
03. Discussion on the given topic
04. Cephalometric tracings
 - a. Down's Analysis
 - b. Steiner's Analysis
 - c. Tweed's Analysis

PRACTICAL TRAINING DURING FINAL YEAR B.D.S.

1. Adam's Clasp on Anterior teeth Gauge 0.7mm
 2. Modified Adam's Clasp on upper arch Gauge 0.7mm
 3. High Labial bow with Apron spring on upper arch
(Gauge of Labial bow - 0.9mm, Apron spring - 0.3mm)
 4. Coffin spring on upper arch Gauge 1mm
- Appliance Construction in Acrylic
1. Upper & Lower Hawley's Appliance
 2. Upper Hawley's with Anterior bite plane
 3. Upper Habit breaking Appliance
 4. Upper Hawley's with Posterior bite plane with 'Z' Spring
 5. Construction of Activator
 6. Lower inclined plane/Catalan's Appliance
 7. Upper Expansion plate with Expansion Screw

RECOMMENDED AND REFERENCE BOOKS

1. CONTEMPORARY ORTHODONTICS
2. ORTHODONTICS FOR DENTAL STUDENTS
3. HANDBOOK OF ORTHODONTICS
4. ORTHODONTICS - PRINCIPLES AND PRACTICE
5. DESIGN, CONSTRUCTION AND USE OF REMOVABLE
6. ORTHODONTIC APPLIANCES
7. CLINICAL ORTHODONTICS: VOL1 & 2

WILLIAM R. PROFFIT
WHITE and GARDINER
MOYERS
GRABER

C. PHILIP ADAMS
SALZMANN

15. PAEDIATRIC & PREVENTIVE DENTISTRY

THEORY:

1. INTRODUCTION TO PEDODONTICS & PREVENTIVE DENTISTRY.
 - Definition, Scope, Objectives and Importance.
2. GROWTH & DEVELOPMENT:
 - Importance of study of growth and development in Pedodontics.
 - Prenatal and Postnatal factors in growth & development.
 - Theories of growth & development.
 - Development of maxilla and mandible and related age changes.
3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE.
 - Study of variations and abnormalities.
4. DENTAL ANATOMY AND HISTOLOGY:
 - Development of teeth and associated structures.

- Eruption and shedding of teeth.
- Teething disorders and their management.
- Chronology of eruption of teeth.
- Differences between deciduous and permanent teeth.
- Development of dentition from birth to adolescence.
- Importance of first permanent molar.
- 5. DENTAL RADIOLOGY RELATED TO PEDODONTICS.
- 6. ORAL SURGICAL PROCEDURES IN CHILDREN.
 - Indications and contraindications of extractions of primary and permanent teeth in children.
 - Knowledge of Local and General Anesthesia.
 - Minor surgical procedures in children.
- 7. DENTAL CARIES:
 - Historical background.
 - Definition, aetiology & pathogenesis.
 - Caries pattern in primary, young permanent and permanent teeth in children.
 - Rampant caries, early childhood caries and extensive caries:
 - * Definition, aetiology, Pathogenesis, Clinical features, Complications & Management
 - Role of diet and nutrition in Dental Caries.
 - Dietary modifications & Diet counseling.
 - Caries activity, tests, caries prediction, caries susceptibility & their clinical application.
- 8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.
 - Normal gingiva & periodontium in children.
 - Definition, aetiology & Pathogenesis.
 - Prevention & Management of gingival & Periodontal diseases.
- 9. CHILD PSYCHOLOGY:
 - Definition.
 - Theories of child psychology.
 - Psychological development of children with age.
 - Principles of psychological growth & development while managing child patient.
 - Dental fear and its management.
 - Factors affecting child's reaction to dental treatment.
- 10. BEHAVIOUR MANAGEMENT:
 - Definitions.
 - Types of behaviour encountered in the dental clinic.
 - Non-pharmacological & pharmacological methods of Behaviour Management.
- 11. PEDIATRIC OPERATIVE DENTISTRY:
 - Principles of Pediatric Operative Dentistry.
 - Modifications required for cavity preparation in primary and young permanent teeth.
 - Various Isolation Techniques.
 - Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites & Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.
- 12. PEDIATRIC ENDODONTICS
 - Principles & Diagnosis.
 - Classification of Pulpal Pathology in primary, young permanent & permanent teeth.
 - Management of Pulpally involved primary, young permanent & permanent teeth.
 - Pulp capping – direct & indirect.
 - Pulpotomy
 - Pulpectomy
 - Apexogenesis
 - Apexification
 - Obturation Techniques & material used for primary, young permanent & Permanent teeth in children.
- 13. TRAUMATIC INJURIES IN CHILDREN:
 - Classifications & Importance.
 - Sequelae & reaction of teeth to trauma.

- Management of Traumatized teeth.
 - 14. PREVENTIVE & INTERCEPTIVE ORTHODONTICS:
 - Definitions.
 - Problems encountered during primary and mixed dentition phases & their management.
 - Serial extractions.
 - Space management.
 - 15. ORAL HABITS IN CHILDREN:
 - Definition, Aetiology & Classification.
 - Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
 - Management of oral habits in children.
 - 16. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS:
 - Definition, Aetiology, Classification, Behavioural and Clinical features & Management of children with:
 - Physically handicapping conditions.
 - Mentally compromising conditions.
 - Medically compromising conditions.
 - Genetic disorders.
 - 17. CONGENITAL ABNORMALITIES IN CHILDREN:
 - Definition, Classification, Clinical features & Management.
 - 18. DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT.
 - 19. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY.
 - 20. PREVENTIVE DENTISTRY:
 - Definition.
 - Principles & Scope.
 - Types of prevention.
 - Different preventive measures used in Pediatric Dentistry including pit and fissure sealants and caries vaccine.
 - 21. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES.
 - 22. FLUORIDES:
 - Historical background.
 - Systemic & Topical fluorides.
 - Mechanism of action.
 - Toxicity & Management.
 - Defluoridation techniques.
 - 23. CASE HISTORY RECORDING:
 - Outline of principles of examination, diagnosis & treatment planning.
 - 24. SETTING UP OF PEDODONTIC CLINIC.
 - 25. ETHICS.
 - B. PRACTICALS:
- Following is the recommended clinical quota for under-graduate students in the subject of pediatric & preventive dentistry.
1. Restorations - Class I & II only : 45
 2. Preventive measures e.g. Oral Prophylaxis - 20.
 3. Fluoride applications - 10
 4. Extractions - 25
 5. Case History Recording & Treatment Planning - 10
 6. Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measures like tooth brushing, flossing etc.
- BOOKS RECOMMENDED & REFERENCE:
1. Pediatric Dentistry (Infancy through Adolescence) - Pinkham.
 2. Kennedy's Pediatric Operative Dentistry - Kennedy & Curzon.
 3. Occlusal guidance in Pediatric Dentistry - Stephen H. Wei.
 4. Clinical Use of Fluorides - Stephen H. Wei.
 5. Pediatric Oral & Maxillofacial Surgery - Kaban.
 6. Pediatric Medical Emergencies - P. S. Whatt.
 7. Understanding of Dental Caries - Niki Foruk.
 8. An Atlas of Glass Ionomer cements - G. J. Mount.
 9. Clinical Pedodontics - Finn.
 10. Textbook of Pediatric Dentistry - Braham Morris.

11. Primary Preventive Dentistry – Norman O. Harris.
12. Handbook of Clinical Pedodontics – Kenneth. D.
13. Preventive Dentistry – Forrester.
14. The Metabolism and Toxicity of Fluoride – Garry M. whitford.
15. Dentistry for the Child and Adolescence – Mc. Donald.
16. Pediatric Dentistry – Dancle S. G.
17. Behaviour Management – Wright
18. Pediatric Dentistry – Mathewson.
19. Traumatic Injuries – andreason.
20. Occlusal guidance in Pediatric Dentistry – Nakata.
21. Pediatric Drug Therapy – Tomare
22. Contemporary Orthodontics – Profit.
23. Preventive Dentistry – Depaola.
24. Metabolism & Toxicity of Fluoride – whitford. G. M.
25. Endodontic Practice – Grossman.
26. Principles of Endodontics – Munford.
27. Endodontics – Ingle.
28. Pathways of Pulp – Cohen.
29. Management of Traumatized anterior Teeth – Hargreaves.

16. PUBLIC HEALTH DENTISTRY

GOAL:

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

OBJECTIVES:

Knowledge:

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

Skill and Attitude:

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

Communication abilities:

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

Syllabus:

1. Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.
2. Public Health:
 - i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics
 - ii. Public Health: - Definition & Concepts, History of public health
 - iii. General Epidemiology: - Definition, objectives, methods
 - iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder
 - v. Health Education: - Definition, concepts, principles, methods, and health education aids
 - vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management.
 - vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of identification in forensic dentistry.
 - viii. Nutrition in oral diseases
 - ix. Behavioral science: Definition of sociology, anthropology and psychology and their in dental practice and community.
 - x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health organizations.

Dental Public Health:

1. Definition and difference between community and clinical health.
2. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.
3. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.
4. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.
5. Payments of dental care: Methods of payments and dental insurance, government plans
6. Preventive Dentistry- definition, Levels, role of individual, community and profession, fluorides in dentistry, plaque control programmes.

Research Methodology and Dental Statistics

1. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes
2. Research Methodology: -Definition, types of research, designing a written protocol
3. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques-types, errors, bias, blind trails and calibration.

Practice Management

1. Place and locality
2. Premises & layout
3. Selection of equipments
4. Maintenance of records/accounts/audit.

Dentist Act 1948 with amendment.**Dental Council of India and State Dental Councils****Composition and responsibilities.****Indian Dental Association****Head Office; State, local and branches.****PRACTICALS/CLINICALS/FIELD PROGEAMME IN COMMUNITY DENTISTRY:**

These exercises designed to help the student in IV year students:

1. Understand the community aspects of dentistry
2. To take up leadership role in solving community oral health programme

Exercises:

- a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income
- b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels
- c) Preparation of oral health education material posters, models, slides, lectures, play acting skits etc.
- d) Oral health status assessment of the community using indices and WHO basic oral health survey methods
- e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.
- f) Visit to primary health center-to acquaint with activities and primary health care delivery
- g) Visit to water purification plant/public health laboratory/ center for treatment of western and sewage water
- h) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)
- i) Visit to institution for the care of handicapped, physically, mentally, or medically compromised patients
- j) Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients

The colleges are encouraged to involve in the N.S.S. programme for college students for carrying out social work in rural areas

SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY:

I. AT THE COLLEGE:

Students are posted to the department to get training in dental practice management.

- (a) Total oral health care approach- in order to prepare the new graduates in their approach to diagnosis, treatment planning, cost of treatment, prevention of treatment on schedule, recall maintenance of records etc. at least 10 patients (both children and adults of all types posting for at least one month).

- (b) The practice of chair side preventive dentistry including oral health education

II. AT THE COMMUNITY ORAL HEALTH CARE CENTRE (ADOPTED BY THE DENTAL COLLEGE IN RURAL AREAS)

Graduates posted for at least one month to familiarize in:

- (a) Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.
- (b) Participation in rural oral health education programmes
- (c) Stay in the village to understand the problems and life in rural areas

III. DESIRABLE: Learning use of computers-at least basic programme.

Examination Pattern

I. Index: Case History

- b) Oral hygiene indices simplified- Green and Vermilion
- c) Silness and Loe index for Plaque
- d) Loe and Silness index for gingival
- e) CPI
- f) DMF: T and S, df:t and s
- g) Deans fluoride index

II. Health Education

1. Make one - Audio visual aid
2. Make a health talk

III. Practical work

1. Pit and fissure sealant
2. Topical fluoride application

BOOKS RECOMMENDED & REFERENCE:

1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. -1983, W. B. Saunders Company
2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.
3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981
4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/New York, 1981
5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachusetts, 1980.
6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wrioth and sons Bristol, 1980
7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.
8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristol, 1980.
10. Preventive Dentistry by Murray, 1997.
11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.
12. Community Dentistry by Dr. Soben Peter.
13. Introduction to Bio-statistics by B. K. Mahajan
14. Research methodology and Bio-statistics by
15. Introduction to Statistical Methods by Grewal

17. PERIODONTOLOGY

OBJECTIVES:

The student shall acquire the skill to perform dental scaling ,diagnostic tests of periodontal diseases; to use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop an attitude to perform the treatment with full aseptic precautions; shall develop an attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care.

1. Introduction: Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics
2. Development of perio-dontal tissues, micro-structural anatomy and biology of periodontal tissues in detail Gingiva, Junctional epithelium in detail, Epithelial-Mesenchymal interaction, Periodontal ligament Cementum, Alveolar bone.
3. Defensive mechanisms in the oral cavity: Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment.
4. Age changes in periodontal structures and their significance in Geriatric dentistry Age changes in teeth and periodontal structures and their association with periodontal diseases 1
5. Classification of periodontal diseases Need for classification, Scientific basis of classification 1
 Classification of gingival and periodontal diseases as described in World Workshop 1989
 Gingivitis:
 Plaque associated, ANUG, steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.
 Periodontitis:
 Adult periodontitis, Rapidly progressive periodontitis A&B, Juvenile periodontitis (localized, generalized, and post-juvenile),
 Prepubertal periodontitis,
 Refractory periodontitis
 Localized and generalized gingivitis, Papillary, 6
 marginal and diffuse gingivitis
 Etiology, pathogenesis, clinical signs, symptoms and management of
 i) Plaque associated gingivitis
 ii) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)
 iii) ANUG
 iv) Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions
 v) Allergic gingivitis
 vi) Infective gingivitis-Herpetic, bacterial and candidial
 vii) Pericoronitis
 viii) Gingival enlargement (classification and differential diagnosis)
6. Gingival diseases
7. Epidemiology of periodontal diseases - Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic 2
 - Classification of indices (Irreversible and reversible)
 - Deficiencies of earlier indices used in Periodontics
 - Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN & CPI.
 - Prevalence of periodontal diseases in India and other countries.
 - Public health significance (All these topics are

- covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination
8. Extension of inflammation from gingiva 1
 9. Pocket 2
 10. Etiology 5
- Mechanism of spread of inflammation from gingival area to deeper periodontal structures
 - Factors that modify the spread
 - Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket
 - Dental Plaque (Biofilm)
 - Definition, New concept of biofilm
 - Types, composition, bacterial colonization, growth, maturation & disclosing agents
 - Role of dental plaque in periodontal diseases
 - Plaque microorganisms in detail and bacteria associated with periodontal diseases
 - Plaque retentive factors
 - Materia alba
 - Food debris
 - Calculus
 - Definition
 - Types, composition, attachment, theories of formation
 - Role of calculus in disease
 - Food Impaction
 - Definition
 - Types, Etiology
 - Hirschfelds' classification
 - Signs, symptoms & sequelae of treatment
 - Trauma from occlusion
 - Definition, Types
 - Histopathological changes
 - Role in periodontal disease
 - Measures of management in brief
 - Habits
 - Their periodontal significance
 - Bruxism & parafunctional habits, tongue thrusting, lip biting, occupational habits
 - IATROGENIC FACTORS
 - Conservative Dentistry
 - Restorations
 - Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth
 - Prosthodontics
 - Interrelationship
 - Bridges and other prosthesis, pontics (types), surface contour, relationships of margins to the periodontium, Gingival protection theory, muscle action theory & theory of access to oral hygiene.
 - Orthodontics
 - Interrelationship, removable appliances & fixed appliances
 - Retention of plaque, bacterial changes
 - Systemic diseases
 - Diabetes, sex hormones, nutrition (Vit. C & proteins)
 - AIDS & periodontium
 - Hemorrhagic diseases, Leukemia, clotting factor disorders, PMN disorders

11.	Risk factors	Definition. Risk factors for periodontal diseases	1
12.	Host response	- Mechanism of initiation and progression of periodontal diseases	3
		- Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief	
		- Stages in gingivitis-Initial, early, established & advanced	
		- Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	
13.	Periodontitis	- Etiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult periodontitis	6
		- Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment	
		- Furcation involvement, Glickmans' classification, prognosis and management	
		- Rapidly progressive periodontitis	
		- Juvenile periodontitis: Localized and generalized	
		- Post-juvenile periodontitis	
		- Periodontitis associated with systemic diseases	
		- Refractory periodontitis	
14.	Diagnosis	- Routine procedures, methods of probing, types of probes, (According to case history)	2
		- Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	
15.	Prognosis	- Definition, types, purpose and factors to be taken into consideration	1
16.	Treatment plan	- Factors to be considered	1
17.	Periodontal therapy	A. General principles of periodontal therapy. Phase I, II, III, IV therapy.	3
		Definition of periodontal regeneration, repair, new attachment and reattachment.	
		B. Plaque control	
		i. Mechanical tooth brushes, interdental cleaning aids, dentifrices	
		ii. Chemical; classification and mechanism of action of each	
		& pocket irrigation	
18.	Pocket eradication procedures	- Scaling and root planing:	5
		- Indications	
		- Aims & objectives	
		- Healing following root planning	
		- Hand instruments, sonic, ultrasonic & piezo-electric scalers	
		- Curettage & present concepts.	
		- Definition	
		- Indications	
		- Aims & objectives	
		- Procedures & healing response	
		- Flap surgery	
		- Definition	
		- Types of flaps, Design of flaps, papilla preservation	
		- Indications & contraindications	
		- Armamentarium	
		- Surgical procedure & healing	

9.	Osseous Surgery	response Osseous defects in periodontal disease - Definition - Classification - Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts) - Healing responses - Other regenerative procedures; root conditioning - Guided tissue regeneration	2
20.	Mucogingival surgery & periodontal plastic surgeries	Definition Mucogingival problems: etiology, classification of gingival recession (P.D. Miller Jr. and Sullivan and Atkins) Indications & objectives Gingival extension procedures: lateral pedicle graft, frenectomy, frenotomy Crown lengthening procedures Periodontal microsurgery in brief	3
21.	Splints	- Periodontal splints - Purpose & classification - Principles of splinting	1
22.	Hypersensitivity	Causes, Theories & management	1
23.	Implants	Definition, types, scope & biomaterials used. Periodontal considerations: such as implant-bone interface, implant-gingiva interface, implant failure, peri-implantitis & management	1
24.	Maintenance phase (SPT)	- Aims, objectives, and principles - Importance - Procedures - Maintenance of implants	1
25.	Pharmaco-therapy	- Periodontal dressings - Antibiotics & anti-inflammatory drugs - Local drug delivery systems	2
26.	Periodontal management of medically compromised patients	Topics concerning periodontal management of medically compromised patients	1
27.	Inter-disciplinary care	- Pulpo-periodontal involvement - Routes of spread of infection - Simons' classification - Management	1
28.	Systemic effects of periodontal diseases in brief	Cardiovascular diseases, Low birth weight babies etc.	1
29.	Infection control protocol	Sterilization and various aseptic procedures	1
30.	Ethics		

TUTORIALS DURING CLINICAL POSTING:

1. Infection control
2. Periodontal instruments
3. Chair position and principles of instrumentation
4. Maintenance of instruments (sharpening)
5. Ultrasonic, Piezoelectric and sonic scaling – demonstration of technique
6. Diagnosis of periodontal disease and determination of prognosis
7. Radiographic interpretation and lab investigations
8. Motivation of patients- oral hygiene instructions

Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment. Student should perform scaling, root planning local drug delivery and SPT. Shall be given demonstration of all periodontal surgical procedures.

DEMONSTRATIONS:

1. History taking and clinical examination of the patients
2. Recording different indices
3. Methods of using various scaling and surgical instruments
4. Polishing the teeth
5. Bacterial smear taking
6. Demonstration to patients about different oral hygiene aids
7. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
8. Follow up procedures, post operative care and supervision

REQUIREMENTS:

1. Diagnosis, treatment planning and discussion and total periodontal treatment - 25 cases
2. Dental scaling, oral hygiene instructions - 50 complete cases/ equivalent
3. Assistance in periodontal surgery - 5 cases
4. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

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

PRESCRIBED BOOK:

1. Glickman's Clinical Periodontology — Carranza

REFERENCE BOOKS

1. Essentials of Periodontology and periodontics- Torquill MacPhee
2. Contemporary periodontics- Cohen
3. Periodontal therapy- Goldman
4. Orbans' periodontics- Orban
5. Oral Health Survey- W.H.O.
6. Preventive Periodontics- Young and Stiffler
7. Public Health Dentistry- Slack
8. Advanced Periodontal Disease- John Prichard
9. Preventive Dentistry- Forrest
10. Clinical Periodontology- Jan Lindhe
11. Periodontics- Baer & Morris.

18. PROSTHODONTICS AND CROWN & BRIDGE**Complete Dentures**

- A. Applied Anatomy and Physiology.
 1. Introduction
 2. Biomechanics of the edentulous state.
 3. Residual ridge resorption.
- B. Communicating with the patient
 1. Understanding the patients.
 - Mental attitude.
 2. Instructing the patient.
- C. Diagnosis and treatment planning for patients-
 1. With some teeth remaining.
 2. With no teeth remaining.
 - a) Systemic status.
 - b) Local factor.
 - c) The geriatric patient.
 - d) Diagnostic procedures.
- D. Articulators- discussion
- E. Improving the patient's denture foundation and ridge relation -an overview.
 - a) Pre-operative examination.
 - b) Initial hard tissue & soft tissue procedure.
 - c) Secondary hard & soft tissue procedure.
 - d) Implant procedure.
 - e) Congenital deformities.
 - f) Postoperative procedure.

- F. Principles of Retention, Support and Stability
- G. Impressions - detail.
 - a) Muscles of facial expression.
 - b) Biologic considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.
 - c) Impression objectives.
 - d) Impression materials.
 - e) Impression techniques.
 - f) Maxillary and mandibular impression procedures.
 - i. Preliminary impressions.
 - ii. Final impressions.
 - g) Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).
- H. Record bases and occlusion rims- in detail.
 - a) Materials & techniques.
 - b) Useful guidelines and ideal parameters.
 - c) Recording and transferring bases and occlusal rims.
- I. Biological consideration in jaw relation & jaw movements - craniomandibular relations.
 - a) Mandibular movements.
 - b) Maxillo -mandibular relation including vertical and horizontal jaw relations.
 - c) Concept of occlusion- discuss in brief.
- J. Relating the patient to the articulator.
 - a) Face bow types & uses- discuss in brief.
 - b) Face bow transfer procedure - discuss in brief.
- K. Recording maxillo mandibular relation.
 - a) Vertical relations.
 - b) Centric relation records.
 - c) Eccentric relation records.
 - d) Lateral relation records.
- L. Tooth selection and arrangement.
 - a) Anterior teeth.
 - b) Posterior teeth.
 - c) Esthetic and functional harmony.
- M. Relating inclination of teeth to concept of occlusion- in brief.
 - a) Neutrocentric concept.
 - b) Balanced occlusal concept.
- N. Trial dentures.
- O. Laboratory procedures.
 - a) Wax contouring.
 - b) Investing of dentures.
 - c) Preparing of mold.
 - d) Preparing & packing acrylic resin.
 - e) Processing of dentures.
 - f) Recovery of dentures.
 - g) Lab remount procedures.
 - h) Recovering the complete denture from the cast.
 - i) Finishing and polishing the complete denture.
 - j) Plaster cast for clinical denture remount procedure.
- P. Denture insertion.
 - a) Insertion procedures.
 - b) Clinical errors.
 - c) Correcting occlusal disharmony.
 - d) Selective grinding procedures.

- R. Treating problems with associated denture use - discuss in brief (tabulation/flow-chart form).
- S. Treating abused tissues - discuss in brief.
- T. Relining and rebasing of dentures - discuss in brief.
- V. Immediate complete dentures construction procedure - discuss in brief.
- W. The single complete denture - discuss in brief.
- X. Overdentures denture; discuss in brief.
- Y. Dental implants in complete denture - discuss in brief.

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

1. Definition
2. Diagnosis (of the particular situation/patient selection/treatment planning)
3. Types / Classification
4. Materials
5. Methodology - Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase
9. Oral Implantology
10. Ethics

Removable Flexible Dentures

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

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

1. Definition
2. Diagnosis (of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology - Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

Fixed Partial Dentures**Topics To Be Covered In Detail :**

1. Introduction
2. Fundamentals of occlusion - in brief.
3. Articulators - in brief.
4. Treatment planning for single tooth restorations.
5. Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.
6. Fixed partial denture configurations.
7. Principles of tooth preparations.
8. Preparations for full veneer crowns - in detail.
9. Preparations for partial veneer crowns - in brief.
10. Provisional Restorations
11. Fluid Control and Soft Tissue Management
12. Impressions
13. Working Casts and Dies
14. Wax Patterns
15. Pontics and Edentulous Ridges
16. Esthetic Considerations
17. Finishing and Cementation

Topics To Be Covered In Brief -

1. Solder Joints and Other Connectors
2. All - Ceramic Restorations
3. Metal - Ceramic Restorations
4. Preparations of intracoronar restorations.
5. Preparations for extensively damaged teeth.
6. Preparations for periodontally weakened teeth
7. The Functionally Generated Path Technique
8. Investing and Casting
9. Resin - Bonded Fixed Partial Denture

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

1. Definition
2. Diagnosis (of the particular situation / patient selection / treatment planning)
3. Types / Classification
4. Materials
5. Methodology - Lab / Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

RECOMMENDED BOOKS:

1. Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahn.
2. Boucher's "Prosthodontic treatment for edentulous patients"
3. Essentials of complete denture prosthodontics by - Sheldon Winkler.
4. Maxillofacial prosthetics by - William R. Laney.
5. McCracken's Removable partial prosthodontics
6. Removable partial prosthodontics by - Ernest L. Miller and Joseph E. Grasso.

19. AESTHETIC DENTISTRY

Aesthetic Dentistry is gaining more popularity since last decade. It is better that undergraduate students should understand the philosophy and scientific knowledge of the esthetic dentistry.

1. Introduction and scope of esthetic dentistry
2. Anatomy & physiology of smile
3. Role of the colour in esthetic dentistry
4. Simple procedures (roundening of central incisors to enhance esthetic appearance)
5. Bleaching of teeth
6. Veneers with various materials
7. Preventive and interceptive esthetics
8. Ceramics

9. Simple gingival contouring to enhance the appearance
10. Simple clinical procedures for BDS students

Recommended books:

1. Esthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

20. FORENSIC ODONTOLOGY (30 hrs of instruction)

Definition

Forensic is derived from the Latin word forum, which means 'court of law.' Odontology literally implies 'the study of teeth.' Forensic odontology, therefore, has been defined by the Fédération Dentaire Internationale (FDI) as "that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence, and with the proper evaluation and presentation of dental findings."

Objectives of the undergraduate curriculum

At the end of the programme, the dental graduate should:

1. Have sound knowledge of the theoretical and practical aspects of forensic odontology.
2. Have an awareness of ethical obligations and legal responsibilities in routine practice and forensic casework.
3. Be competent to recognise forensic cases with dental applications when consulted by the police, forensic pathologists, lawyers and associated professionals.
4. Be competent in proper collection of dental evidence related to cases of identification, ethnic and sex differentiation, age estimation and bite marks.
5. Be able to assist in analysis, evaluation, and presentation of dental facts within the realm of law.

Curriculum for forensic odontology

1. Introduction to forensic dentistry
 - Definition and history
 - Recent developments and future trends
2. Overview of forensic medicine and toxicology
 - Cause of death and postmortem changes
 - Toxicological manifestations in teeth and oral tissues
3. Dental identification
 - Definition
 - Basis for dental identification
 - Postmortem procedures
 - Dental record compilation and interpretation
 - Comparison of data, and principles of report writing
 - Identification in disasters and handling incinerated remains
 - Postmortem changes to oral structures
4. Maintaining dental records
 - Basic aspects of good record-keeping
 - Different types of dental records
 - Dental charts
 - Dental radiographs
 - Study casts
 - Denture marking
 - Photographs
 - Dental notations
 - Relevance of dental records in forensic investigation
5. Age estimation
 - Age estimation in children and adolescents
 - Advantages of tooth calcification over 'eruption' in estimating age
 - Radiographic methods of Schour & Massler, Demirjian et al
 - Age estimation in adults
 - Histological methods - Gustafson's six variables and Johanson's modification, Bang & Ramm's dentine translucency
 - Radiographic method of Kvaal et al

- Principles of report writing
- 6. Sex differentiation
 - Sexual dimorphism in tooth dimensions (Odontometrics)
- 7. Ethnic variations ('racial' differences) in tooth morphology
 - Description of human population groups
 - Genetic and environmental influences on tooth morphology
 - Description of metric and non-metric dental features used in ethnic differentiation
- 8. Bite mark procedures
 - Definition and classification
 - Basis for bite mark investigation
 - Bite mark appearance
 - Macroscopic and microscopic ageing of bite marks
 - Evidence collection from the victim and suspect of bite mark
 - Analysis and comparison
 - Principles of report writing
 - Animal bite investigation
- 9. Dental DNA methods
 - Importance of dental DNA evidence in forensic investigations
 - Types of DNA and dental DNA isolation procedures
 - DNA analysis in personal identification
 - Gene-linked sex dimorphism
 - Population genetics
- 10. Jurisprudence and ethics
 - Fundamentals of law and the constitution
 - Medical legislation and statutes (Dental and Medical Council Acts, etc)
 - Basics of civil law (including torts, contracts and consumer protection act)
 - Criminal and civil procedure code (including expert witness requirement)
 - Assessment and quantification of dental injuries in courts of law
 - Medical negligence and liability
 - Informed consent and confidentiality
 - Rights and duties of doctors and patients
 - Medical and dental ethics (as per Dentists' Act)

Theory sessions and practical exercises

Total hours for the course

- Didactic – 10-12 hours
- Practical – 20-25 hours

Detailed didactic sessions for the above components, either in the form of lectures or as structured student-teacher interactions, is essential. Specialists from multiple disciplines, particularly from legal and forensic sciences, can be encouraged to undertake teaching in their area of expertise.

An interactive, navigable and non-linear (INN) model may also be utilised for education.

Practical exercises (real-life casework and/or simulated cases) must complement didactic sessions to facilitate optimal student understanding of the subject. Mandatory practical training in dental identification methods, dental profiling (ethnic and sex differences, radiographic age estimation), and bite mark procedures, is of paramount importance. In addition, practical exercises/demonstrations in histological age estimation, comparative dental anatomy, DNA methods, medical autopsy, court visits, and other topics may be conducted depending on available expertise, equipment and feasibility.

Approach to teaching forensic odontology

Forensic odontology could be covered in two separate streams. The divisions include a preclinical stream and a clinical stream.

Preclinical stream

- Introduction to forensic odontology
- Sex differences in odontometrics
- Ethnic variations in tooth morphology
- Histological age estimation
- Dental DNA methods
- Bite marks procedures

- Overview of forensic medicine and toxicology

It could prove useful to undertake the preclinical stream in II or III year under Oral Biology/Oral Pathology since these aspects of forensic odontology require grounding in dental morphology, dental histology and basic sciences, which, students would have obtained in I and/or II BDS.

Clinical stream

- Dental identification
- Maintaining dental records
- Radiographic age estimation
- Medical jurisprudence and ethics

It would be suitable to undertake these topics in the IV or V year as part of Oral Medicine and Radiology, since students require reasonable clinical exposure and acumen to interpret dental records, perform dental postmortems and analyse dental radiographs for age estimation.

21. ORAL IMPLANTOLOGY (30 hrs of instruction)

INTRODUCTION TO ORAL IMPLANTOLOGY

Oral Implantology is now emerged as a new branch in dentistry world wide and it has been given a separate status in the universities abroad. In India day to day the practice of treating patients with implants are on rise. In this context inclusion of this branch into under graduate curriculum has become very essential. The objective behind this is to impart basic knowledge of Oral Implantology to undergraduates and enable them to diagnose, plan the treatment and to carry out the needed pre surgical mouth preparations and treat or refer them to speciality centres. This teaching programme may be divided and carried out by the Dept. of Oral Surgery, Prosthodontics and Periodontics.

1. History of implants, their design & surface characteristics and osseo-integration
2. Scope of oral & maxillofacial implantology & terminologies
3. A brief introduction to various implant systems in practice
4. Bone biology, Morphology, Classification of bone and its relevance to implant treatment and bone augmentation materials.
5. Soft tissue considerations in implant dentistry
6. Diagnosis & treatment planning in implant dentistry
Case history taking/Examination/Medical evaluation/Orofacial evaluation/
Radiographic evaluation/ Diagnostic evaluation/ Diagnosis and treatment planning/
treatment alternatives/ Estimation of treatment costs/ patient education and
motivation
7. Pre surgical preparation of patient
8. Implant installation & armamentarium for the Branemark system as a role model
9. First stage surgery – Mandible – Maxilla
10. Healing period & second stage surgery
11. Management of surgical complications & failures
12. General considerations in prosthodontic reconstruction & Bio mechanics
13. Prosthodontic components of the Branemark system as a role model
14. Impression procedures & Preparation of master cast
15. Jaw relation records and construction of suprastructure with special emphasis on occlusion for osseointegrated prosthesis
16. Management of prosthodontic complications & failures
17. Recall & maintenance phase.

Criteria for success of osseointegrated implant supported prosthesis

SUGGESTED BOOKS FOR READING

1. Contemporary Implant Dentistry
Carl E. Misch
Mosby 1993 First Edition.
2. Osseointegration and Occlusal Rehabilitation
Hobo S., Ichida. E. and
Garcia L.T.
Quintessence Publishing Company, 1989
First Edition.

22. BEHAVIOURAL SCIENCES (20 hrs. of instruction)**GOAL:**

The aim of teaching behavioural sciences to undergraduate student is to impart such knowledge & skills that may enable him to apply principles of behaviour –

- a) For all round development of his personality
- b) In various therapeutic situations in dentistry.

The student should be able to develop skills of assessing psychological factors in each patient, explaining stress, learning simple counselling techniques, and improving patients compliance behaviour.

OBJECTIVES:**A) KNOWLEDGE & UNDERSTANDING:**

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

- 1) Comprehend different aspects of normal behaviour like learning, memory, motivation, personality & intelligence.
- 2) Recognise difference between normal and abnormal behaviour.
- 3) Classify psychiatric disorders in dentistry.
- 4) Recognise clinical manifestations of dental phobia, dental anxiety, facial pain orofacial manifestations of psychiatric disorders, and behavioural problems in children. Addictive disorders, psychological disorders in various dental departments.
- 5) Should have understanding of stress in dentistry and knowledge of simple counselling techniques.
- 6) Have some background knowledge of interpersonal, managerial and problem solving skills which are an integral part of modern dental practice.
- 7) Have knowledge of social context of dental care.

B) SKILLS

The student shall be able to:

- 1) Interview the patient and understand different methods of communication skills in dentist - patient relationship.
- 2) Improve patients compliance behaviour.
- 3) Develop better interpersonal, managerial and problem solving skills.
- 4) Diagnose and manage minor psychological problems while treating dental patients.

INTEGRATION:

The training in Behavioural sciences shall prepare the students to deliver preventive, promotive, curative and rehabilitative services to the care of the patients both in family and community and refer advanced cases to specialised psychiatric hospitals.

Training should be integrated with all the departments of Dentistry, Medicine, Pharmacology, Physiology and Biochemistry.

PSYCHOLOGY:

1. Definition & Need of Behavioural Science. Determinants of Behaviour. Hrs 1
Scope of Behavioural Science.
2. Sensory process & perception perceptual process- clinical applications.
3. Attention - Definition - factors that determine attention. Clinical application.
4. Memory - Memory process - Types of memory, Forgetting:
Methods to improve memory, Clinical assessment of memory & clinical applications.
5. Definition - Laws of learning
Type of learning. Classical conditioning, operant conditioning, cognitive learning, Insight learning, social learning, observational learning, principles of learning- Clinical application.
6. Intelligence- Definition: Nature of intelligence stability of intelligence
Determinants of intelligence, clinical application
7. Thinking - Definition: Types of thinking, delusions, problem solving

8. **Motivation** - Definition: Motive, drive, needs classification of motives
9. **Emotions** - Definition differentiation from feelings - Role of hypothalamus, Cerebral cortex, adrenal glands ANS. Theories of emotion, Types of emotions.
Personality. Assessment of personality: Questionnaires, personality inventory, rating scales, Interview projective techniques - Rorshach ink blot test, RAT, CAT

SOCIOLOGY:

Social class, social groups - family, types of family, types of marriages, communities and Nations and institutions.

REFERENCE BOOKS:

1. General psychology -- S.K. Mangal
2. General psychology -- Hans Raj, Bhatia
3. General psychology -- Munn
4. Behavioural Sciences in Medical practise -- Manju Mehta
5. Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

23. ETHICS (20 hrs. of instruction)**Introduction:**

There is a definite shift now from the traditional patient and doctor relationship and delivery of dental care. With the advances in science and technology and the increasing needs of the patient, their families and community, there is a concern for the health of the community as a whole. There is a shift to greater accountability to the society. Dental specialists like the other health professionals are confronted with many ethical problems. It is therefore absolutely necessary for each and every one in the health care delivery to prepare themselves to deal with these problems. To accomplish this and develop human values Council desires that all the trainees undergo ethical sensitization by lectures or discussion on ethical issues, discussion of cases with an important ethical component.

Course content:**Introduction to ethics -**

- what is ethics?
- What are values and norms?
- How to form a value system in one's personal and professional life?
- Hippocratic oath.
- Declaration of Helsinki, WHO declaration of Geneva, International code of ethics, DCI Code of ethics.

Ethics of the individual -

- The patient as a person.
- Right to be respected
- Truth and confidentiality
- Autonomy of decision
- Doctor Patient relationship

Profession Ethics -

- Code of conduct
- Contract and confidentiality
- Charging of fees, fee splitting
- Prescription of drugs
- Over-investigating the patient
- Malpractice and negligence

Research Ethics -

- Animal and experimental research/humanness
- Human experimentation
- Human volunteer research-informed consent
- Drug trials

Ethical workshop of cases

- Gathering all scientific factors
- Gathering all value factors
- Identifying areas of value - conflict, setting of priorities
- Working our criteria towards decisions

Recommended Reading:

Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189

Maj Gen (Retd.) P. N. AWASTHI, Secy.

/MSN/

[ADVT III/IV/Exty./98/07]