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भारतीय दन्त परिषद्

अधिसूचना

नई दिल्ली, 20 नवम्बर, 2007

संशोधित एमडीएस पाठ्यक्रम विनियम, 2007

सं. डीई-22-2007.—दन्त चिकित्सक अधिनियम, 1948 की धारा 20 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए भारतीय दन्त परिषद् द्वारा केन्द्र सरकार की पूर्व स्वीकृति के साथ निम्नलिखित संशोधित एमडीएस पाठ्यक्रम विनियम बनाए हैं :-

1. लघु शीर्ष और प्रारम्भ.—(i) इन विनियमों को भारतीय दन्त परिषद् संशोधित एमडीएस पाठ्यक्रम विनियम, 2007 कहा जा सकता है।  
(ii) वे सरकारी राजपत्र में उनके प्रकाशन की तारीख से प्रभावी होंगे।

खंड-I

एमडीएस की डिग्री के लिए विनियम

विशेष अनुशीलन प्रशिक्षण के लिए मांग में वृद्धि के मद्देनजर भारतीय दन्त चिकित्सा परिषद् ने इच्छा व्यक्त की है कि उपयुक्त अवसरचलात्मक सुविधाओं, संकाय और पर्याप्त चिकित्सीय सामग्री वाली सभी दन्त चिकित्सा संस्थाएँ स्नातकोत्तर पाठ्यक्रम प्रारम्भ करेंगी। तथापि कोई भी संस्था दन्त चिकित्सक (संशोधन) अधिनियम, 1993 के प्रावधान और उसके अन्तर्गत बनाए गए विनियमों के अनुसार भारत सरकार के पूर्व अनुमोदन के बिना स्नातकोत्तर पाठ्यक्रम प्रारम्भ नहीं करेगी। पी.जी. के आवेदन पर विचार करने से पहले डीसीआई द्वारा बीडीएस के स्तर तक अवसरचलात्मक सुविधाओं की उपलब्धता का सत्यापन करने के लिए संस्था का आवधिक निरीक्षण किया जाएगा।

पात्रता :

एमडीएस के पाठ्यक्रम (दन्त शल्य चिकित्सा का मास्टर) में प्रवेश पाने के लिए एक अभ्यर्थी के पास दन्त चिकित्सक अधिनियम, 1948 की धारा 10(2) के अन्तर्गत मान्यता प्राप्त दन्त महाविद्यालय के सम्बन्ध में एक भारतीय विश्वविद्यालय द्वारा प्रदान की गयी बीडीएस (दन्त शल्य चिकित्सा का बैचुलर) की एक मान्यता प्राप्त डिग्री अथवा भारतीय दन्त चिकित्सा परिषद् द्वारा मान्यता प्राप्त एक समकक्ष योग्यता होनी चाहिए और उसके द्वारा राज्य दन्त चिकित्सा परिषद् के पास स्थायी पंजीकरण प्राप्त किया जाना चाहिए। उपरोक्त प्रयोजनार्थ एक मान्यता प्राप्त दन्त चिकित्सा की योग्यता न रखने वाले अभ्यर्थियों को भारत में किसी विश्वविद्यालय के एमडीएस पाठ्यक्रम में दाखिला लेने से पहले भारतीय दन्त चिकित्सा परिषद् द्वारा अपनी योग्यताओं का पूर्व अनुमोदन प्राप्त करना चाहिए।

जिन अभ्यर्थियों के पास खास विशेष अनुशीलन में 2 वर्षों (प्रस्तावित) की अवधि का डीसीआई द्वारा मान्यता प्राप्त पीजी डिप्लोमा है वे उसी विशेष अनुशीलन में एमडीएस के दाखिले के लिए पात्र हैं और इसकी अवधि 2 वर्ष होगी। दो वर्षों के कार्यक्रम का पाठ्यक्रम संबंधित विश्वविद्यालय के दिशानिर्देशों के अनुसार होगा।

परन्तु एक विदेशी नागरिक के मामले में भारतीय दन्त चिकित्सा परिषद् पंजीकरण के लिए निर्धारित फीस के भुगतान पर उस दन्त चिकित्सा महाविद्यालय/संस्था तक सीमित स्नातकोत्तर प्रशिक्षण की अवधि के लिए अस्थायी पंजीकरण प्रदान कर सकता है जिसमें वह एक मात्र रूप से स्नातकोत्तर अभ्ययन के लिए वर्तमान में दाखिला प्राप्त करता है।

परन्तु कि ऐसे विदेशी नागरिक को आगामी अस्थायी पंजीकरण इस शर्त के अधीन होगा कि ऐसा व्यक्ति अपने उस देश में दन्त चिकित्सा के पेशेवर के रूप में विधिवत पंजीकृत हो जिससे उसने अपनी मूल दन्त चिकित्सा की योग्यता प्राप्त की हो और कि उसकी डिग्री को वदतुरूपी दन्त चिकित्सा परिषद् अथवा संबंधित प्राधिकरण द्वारा मान्यता प्रदान की गयी हो।

स्नातकोत्तर विद्यार्थियों का चयन :

- (1) स्नातकोत्तर दन्त चिकित्सा पाठ्यक्रमों (एमडीएस) के लिए विद्यार्थियों का चयन सख्ती से उनकी अकादमिक योग्यता के आधार पर किया जाएगा।
- (2) अकादमिक योग्यता का अवधारण करने के लिए विश्वविद्यालय/संस्था पीजी डिप्लोमा और एमडीएस डिग्री पाठ्यक्रम दोनों के लिए निम्नलिखित क्रियाविधियों में से कोई एक अपना सकती है :
  - (i) उस योग्यता के आधार पर जो कि राज्य सरकार द्वारा अथवा राज्य सरकार द्वारा नियुक्त किए गए सक्षम प्राधिकारी द्वारा अथवा विश्वविद्यालय द्वारा/उसी राज्य में विश्वविद्यालयों के समूह द्वारा आयोजित की गई प्रतिस्पर्धी परीक्षा द्वारा अवधारित की जाए; अथवा
  - (ii) उस योग्यता के आधार पर जो कि राष्ट्रीय स्तर पर आयोजित की गई एक केंद्रीयकृत प्रतिस्पर्धी परीक्षा द्वारा अवधारित की जाए; अथवा

**DENTAL COUNCIL OF INDIA****NOTIFICATION**

New Delhi, the 20th November, 2007

**Revised MDS Course Regulations, 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 MDS Course Regulations :—

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

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

**SECTION-I****REGULATIONS FOR THE MDS DEGREE**

In view of the increase in demand for speciality training, the Dental Council of India desires that, all Dental institutions with proper infrastructural facilities, faculty and adequate clinical material shall start postgraduate courses. However, no institution shall start postgraduate courses without prior approval of Government of India as per the provision of the Dentists (Amendment) Act, 1993 and regulations framed thereunder. Before considering the P.G. application, DCI shall conduct the Periodical Inspection of the Institution to verify the availability of infrastructural facilities up to BDS level.

**ELIGIBILITY:**

A candidate for admission to the MDS Course (Master of Dental Surgery) must have a recognised degree of BDS (Bachelor of Dental Surgery) awarded by an Indian University in respect of recognised Dental College under Section 10(2) of the Dentists Act, 1948 or an equivalent qualification recognized by the Dental Council of India and should have obtained permanent registration with the State Dental Council. Candidates not possessing a recognized Dental qualification for the above purpose should secure the prior approval of his qualifications by the Dental Council of India before he can be admitted to the MDS Course of any University in India.

Candidates who possess PG Diploma recognised by the DCI with the duration of 2 years (proposed) in particular speciality is eligible for admission in MDS in the same speciality and the duration will be 2 years. The syllabus of two years programme will be as per the concerned university guidelines:

Provided that in the case of a foreign national, the Dental Council of India may, on payment of the prescribed fee for registration, grant temporary registration for the duration of the postgraduate training restricted to the dental college/institution to which he is admitted for the time being exclusively for postgraduate studies:

Provided that further temporary registration to such foreign national shall be subject to the condition that such person is duly registered as dental practitioner in his own country from which he has obtained his basic dental qualification and that his degree is recognised by the corresponding dental council or concerned authority.

**SELECTION OF POSTGRADUATE STUDENTS:**

- (1) Students for postgraduate dental courses (MDS) shall be selected strictly on the basis of their academic merit.
- (2) For determining the academic merit, the university/institution may adopt anyone of the following procedures both for P.G. Diploma and MDS Degree courses:
  - (i) On the basis of merit as determined by a competitive test conducted by the State Government or by the competent authority appointed by the State Government or by the University/group of universities in the same state; or
  - (ii) On the basis of merit as determined by a centralised competitive test held at the national level; or
  - (iii) On the basis of the individual cumulative performance at the first, second, third and Final B.D.S. examinations, if such examinations have been passed from the same university; or
  - (iv) Combination of (i) and (iii):

Provided that wherever entrance test for Postgraduate admissions is held by a State Government or a university or any other authorized examining body, the minimum percentage of marks for eligibility for admission to postgraduate Dental courses shall be 50% for general category candidates and 40% for the candidates belonging to Scheduled Castes and Scheduled Tribes:

Provided further that in non-Governmental institutions fifty per cent of the total seats shall be filled by the competent authority and the remaining fifty per cent, by the management of the institution on the basis of merit.

**PERIOD OF TRAINING :**

The Course shall be of three years duration.

All the candidates for the degree of MDS are required to pursue the prescribed course for at least three academic years course as full time candidates in a BDS recognised and MDS approved/recognised Institution under the direction of the Head of the Department, who has to be a recognized postgraduate teacher in that speciality.

**GENERAL:**

- (1) The institutions recognised by the Dental Council of India for running Postgraduate courses prior to the commencement of the Dentists (Amendment) Act, 1993 and those dental colleges recognised for running Bachelor of Dental Surgery (BDS) course or institutions established by the Central Government for the purpose of imparting postgraduate dental education shall be eligible for starting any postgraduate degree or diploma and higher speciality course after a periodic inspection to ascertain the BDS requirement by DCI in all aspects.
- (2) The maximum number of students for a postgraduate dental course, who can be registered in any recognised department, for training for the award of postgraduate degree or diploma by the affiliating university, shall be determined by the facilities available in the department in terms of infrastructure, teaching staff and clinical teaching material. However, to start with a maximum of 3 P.G. Students will be permitted.
- (3) Every student, selected for admission to a postgraduate dental course in any of the dental institutions in the country, shall possess recognised BDS degree or equivalent qualification and should have obtained Registration with any of the State Dental Councils or should obtain the same within one month from the date of his admission, failing which the admission of the candidate shall be cancelled;

Provided that in the case of a foreign national, the Dental Council of India may, on payment of the prescribed fee for registration, allow temporary registration for the duration of the postgraduate training restricted to the dental college/institution to which he is admitted for the time being exclusively for postgraduate studies;

Provided further that temporary registration to such foreign national shall be subject to the condition that such person is duly registered as dental practitioner in his own country from which he has obtained his basic dental qualification and that his degree is recognised by the Dental Council of India and corresponding dental Council or concerned authority and concerned university and M's of External/Home Affairs have no objection for granting admission in India.

- (4) The students undergoing postgraduate courses shall be exposed to the following:-
  - (a) Basics of statistics to understand and critically evaluate published research papers.
  - (b) Few lectures on other type of exposure to human behaviour studies.
  - (c) Basic understanding of pharmaco-economics.
  - (d) Introduction to the non-linear mathematics.

**STAFFING PATTERN FOR POSTGRADUATE DEGREE PROGRAMME**

**STAFF:**

a). To strengthen and maintain the standards of postgraduate training, the council recommends the following minimum faculty requirements for starting and continuation of postgraduate training programmes. Department with one Professor, two Readers, One Lecturer will make a unit and permitted to have three MDS admissions. For each seat of P.G. Diploma course one additional reader is required. Any increase of admissions will be based on the same pattern. Taking into consideration the training requirements in terms of infrastructure and clinical material the Council recommends a maximum of three units in any postgraduate degree department. At a time, maximum 9 P.G. Students in one speciality can be enrolled in all 3 years.

b) A Department, which does not have the above staff pattern, shall not start a postgraduate course in that speciality.

**QUALIFICATIONS FOR A PROFESSOR AND HEAD OF THE POSTGRADUATE DEPARTMENT:****HEAD OF THE POSTGRADUATE DEPARTMENT:**

A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification/Diplomat of National Board in the subject and with one year as Professor and 5 years teaching experience as Reader. Shall have published atleast three papers as first author in his speciality in any National/International journal.

**PROFESSOR:**

A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification/Diplomat of National Board in the subject and with 5 years teaching experience as Reader. Shall have published atleast two papers as first author in his speciality in any National/International journal.

**READER:**

A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification/Diplomat of National Board in the subject and with 4 year's teaching experience after post-graduation. Shall have published atleast one paper as first author in his speciality in any national/international journal.

**PART-TIME TEACHERS:**

Part-time post-graduate teaching faculty (Professors/Readers) are also eligible provided they put in 4 (four) hours a day and can have only one PG student under them.

When the full complement of staff recommended for undergraduate training programme does not exist, the deficiency must be made good before starting of the postgraduate course in that Department.

**Note:**

1. All the teaching faculty should be full time. However part-time faculty can also be accepted as stated above.
2. Faculty who is accepted as PG teacher in a dental institution starting PG Courses will not be accepted for next one year in any other dental institution.
3. Teaching Experience gained in Medical College will not be accepted for PG Dental Teaching. In exceptional cases, the teaching experience, gained in Govt. Dental Colleges, may be considered for further promotion on the basis of total teaching experience.
4. Dental faculty with PG qualification in dentistry, shifting from the Dental Department of a Medical College should complete minimum of 3 years of teaching experience in a Dental College/Institution before being accepted as P.G. faculty.

**EXAMINATIONS****ELIGIBILITY:**

The following requirements should be fulfilled by every candidate to become eligible to appear for the final examination.

**ATTENDANCE:**

Every candidate should have fulfilled the minimum attendance prescribed by Dental Council of India and respective University (80% of the attendance during each academic year of the postgraduate course).

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

**Work diary and log book:** Every candidate shall maintain a work diary and log book for recording his/her participation in the training programmes conducted by the department. The work diary and log book shall be verified and certified by the Head of the Department and Head of the institution. The certification of satisfactory progress is based on the work diary and log book.

**DISSERTATION:**

The dissertation work should have been accepted by the University who appointing the examiners.



**UNIVERSITY EXAMINATION:**

There shall be one examination at the end of 3 years.

**DISSERTATION:**

Every candidate appearing for the MDS degree examination for the first time shall submit with his application for the admission to the Examination, four typewritten copies of a dissertation of a research topic undertaken by the candidate and prepared under the direction and guidance and to the satisfaction of his University teacher. The dissertation should be submitted 3 months prior to the MDS Examination. The dissertation shall be referred to the Examiners for the MDS examination and acceptance of it by the examiners shall be a precondition to the admission of the candidate to the written part of the examination.

A candidate whose dissertation has been accepted by the examiners, but who is declared to have failed at the examination will be permitted to reappear at the subsequent MDS examination without having to prepare a new dissertation, if, however, the dissertation is rejected, the authorities shall give reasons thereof and suggestion for the improvement of the same and the dissertation thus improved will have to be resubmitted to the examiners and accepted before appearing in MDS Examination.

**WRITTEN EXAMINATION:**

The written examination shall consist of four papers, out of which two shall be pertaining to the speciality; one in Applied Basic Sciences and one shall be an Essay. Each paper shall be of three hours duration.

**CLINICAL/PRACTICAL EXAMINATION:**

It should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. The actual format of clinical examination in various specialities could be worked out by various universities making sure that the candidate is given ample opportunity to perform various clinical procedures. The council desires that the actual format is made known to the students prior to the examination well in advance by the respective universities.

**VIVA VOCE EXAMINATION:**

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and verbal communication skills.

The Council desires that only two examiners shall conduct the viva voce at a time as two teams, each team for 20 minutes. When one examiner is conducting the viva, the other examiner could make a note of the questions asked and the performance level to enable proper assessment and award of marks.

**DISTRIBUTION OF MARKS AT THE UNIVERSITY EXAMINATION:****THEORY:**

Paper-I	75 marks
Paper-II	75 marks
Paper-III	75 marks
Paper-IV	75 marks

Total	300 marks
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<b>Practical &amp; Clinical Examination</b>	: 200 marks
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<b>Viva-voce</b>	: 100 marks
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A candidate who wishes to study for MDS in a second speciality shall have to take the full course of 3 years in that speciality.

**EXAMINERS:**

There shall be at least four examiners in each subject. Out of them two shall be external examiners. The qualification and teaching experience for appointment of an examiner shall be as laid down by the Dental Council of India and the respective university.

**EXAMINATION CENTRE:**

When the PG university exam is being conducted in the same city/town having more than one PG institution under the same university, one central examination centre shall be fixed by the concerned university and all the PG students from all the PG institutions of the city will take the examination in that centre only. Centres can be rotated as per the direction of the university.

**VALUATION OF ANSWER BOOKS:**

All the answer books shall be valued by four examiners, two internal and two external and the average marks will be computed.

**CRITERIA FOR DECLARING AS PASS:**

To pass in the University examination, a candidate shall secure in both theory examination and in practical/clinical including viva voce independently an aggregate of 50% of total marks allotted (150 marks out of 300 allotted for theory and 150 out of 200 for clinical + 100 for viva voce together). A candidate securing less marks as described above shall be declared to have failed in the examination.

A candidate who is declared successful in the MDS Examination shall be granted a Degree of Master of Dental Surgery in the respective speciality

**QUALIFICATION & EXPERIENCE FOR EXAMINERS:**

1. He should possess qualification and experience not less than that recommended for a teacher for postgraduate degree programme.
2. No person who is not an active postgraduate teacher in the subject can be appointed as examiner.
3. 50% of the external examiners shall be from outside the State.
4. Reciprocal arrangement of Examiners should be discouraged, in that, the Internal Examiner in a subject should not accepted External Examinership for a College from which External Examiner is appointed in his subject.
5. No person shall be an external examiner for the same institution for more than two consecutive years. However if there is a break of one year the person can be re-appointed.

**SYLLABUS DISTRIBUTION AMONG 4 PAPERS IN VARIOUS SPECIALITIES:****Prosthodontics and Crown & Bridge**

<b>Paper-I</b>	-	Applied Anatomy, physiology, pathology and Dental Materials
<b>Paper-II</b>	-	Removable Prosthodontics and Oral Implantology
<b>Paper-III</b>	-	Fixed Prosthodontics
<b>Paper-IV</b>	-	Essay

**Periodontology**

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

**Oral & Maxillofacial Surgery**

<b>Paper-I</b>	-	Applied Anatomy, Physiology and Pathology
<b>Paper-II</b>	-	Minor oral Surgery and Trauma
<b>Paper-III</b>	-	Maxillofacial Surgery and Oral Implantology
<b>Paper-IV</b>	-	Essay

**Conservative and Endodontics**

<b>Paper-I</b>	-	Applied Anatomy, Physiology, Pathology and dental materials
<b>Paper-II</b>	-	Conservative dentistry & Aesthetic Dentistry
<b>Paper-III</b>	-	Endodontics
<b>Paper-IV</b>	-	Essay

### **Orthodontics & Dentofacial Orthopaedics**

<b>Paper-I</b>	-	Applied anatomy, physiology, pathology, genetics physical anthropology & dental material
<b>Paper-II</b>	-	Diagnosis and treatment planning.
<b>Paper-III</b>	-	Clinical Orthodontics and Mechanotherapy
<b>Paper-IV</b>	-	Essay

### **Oral Pathology & Microbiology and Forensic Odontology**

<b>Paper-I</b>	-	Applied Anatomy, Physiology, Pathology and Research Methodology
<b>Paper-II</b>	-	Oral pathology, Microbiology and Oncology
<b>Paper-III</b>	-	Laboratory Techniques and Diagnosis
<b>Paper-IV</b>	-	Essay

### **Public Health Dentistry**

<b>Paper-I</b>	-	Applied anatomy, physiology, pathology & research methodology
<b>Paper-II</b>	-	Public Health
<b>Paper-III</b>	-	Dental Public Health
<b>Paper-IV</b>	-	Essay

### **Paediatric & Preventive Dentistry**

<b>Paper-I</b>	-	Applied Anatomy, Physiology, Pathology, Microbiology, Nutrition and Dietics
<b>Paper-II</b>	-	Clinical pediatric dentistry
<b>Paper-III</b>	-	Preventive and community dentistry as applied to pediatric dentistry
<b>Paper-IV</b>	-	Essay

### **Oral Medicine and Radiology**

<b>Paper-I</b>	-	Applied anatomy, physiology, pathology and pharmacology.
<b>Paper-II</b>	-	Diagnosis, diagnostic methods and imageology and Applied Oral Pathology
<b>Paper-III</b>	-	Oral medicine, therapeutics and laboratory investigations
<b>Paper-IV</b>	-	Essay

### **INFRASTRUCTURE & FUNCTIONAL REQUIREMENTS :**

1. **Space:** In addition to the BDS functional programme the following physical facilities shall be made available to start postgraduate training programmes leading to MDS degree.
  - a. A separate clinical area for postgraduate students. Minimum Area - 600 sq feet
  - b. A seminar room furnished with proper seating arrangement and audio-visual equipments. Minimum Area - 300 sq. ft.
  - c. A separate room for the use of postgraduate students. Minimum Area - 200 sq.ft.
2. **Equipment:** Each postgraduate department shall be provided with all the required equipments as recommended by Dental Council Of India.
3. **Library:** A departmental library shall be provided with copies of relevant books. In addition a central library should provide all the recent editions of books pertaining to the speciality and allied subjects. In case, the central library is shared with the medical college, there shall be provision for additional space and separate budget allocation for the Dental College.

All the journals of relevant speciality and allied subjects shall be made available.

Minimum 10-15 titles of renowned authors and 6-8 International Journals should be available alongwith 8-10 volume of back issues in each speciality of MDS Course.

**Note:** The Council recommends that all the existing dental institutions shall comply with the new regulations except the land requirement of five acres within a period of three years from the date of notification.

### **MINIMUM REQUIREMENTS TO START MDS COURSE FOR INSTITUTIONS OTHER THAN DENTAL COLLEGES**

Rules and Regulations for Institution where the BDS programme does not exist but which wishes to start a MDS Course in a speciality.

Medical Institutions wanting to start MDS Courses should satisfy the following requirements in addition to what has been recommended already for Dental Colleges:

1. The Institution must be running medical postgraduate courses.
2. The Department should have qualified and experienced teachers following the three tier system as recommended under the BDS programme viz.:
  - a. Professors
  - b. Readers
  - c. Lecturers

The Professor and Reader should have requisite postgraduate qualification and teaching experience as recommended under the MDS Courses in a Dental College/Dental Wing. Further, that the Professors/Readers must have a minimum of three years BDS/MDS teaching experience in a Dental College.

3. All physical facilities including equipment, department library and journals as prescribed under MDS Courses in a Dental College should be available.
4. Training facilities for all Applied Basic Science subjects should be available.

Any of the Institutions, which are not Dental colleges, but want to start a MDS Course, should make an application to the Dental Council of India, which will send out not less than two inspectors, who would inspect the Institution and report to the Council the feasibility of giving such permission to start an MDS Course in the speciality applied for.

(The above statement is made with the full knowledge that there are many Institutions, not being Dental colleges, have excellent facilities and expertise in certain subjects of Dental specialities far better than those at many Dental colleges, which could be made use for the betterment of the Profession. This Council is of the opinion that such institutions which are not Dental Colleges, should be encouraged and helped to develop MDS Courses in the speciality of Dentistry in which they have expertise).

However, such Institutions will not be considered as Dental Colleges/Dental Wings.

#### **SECTION-II**

#### **GOALS & OBJECTIVES OF THE CURRICULUM**

##### **GOALS:**

The goals of postgraduate training in various specialities is to train B.D.S. graduate who will -

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

##### **OBJECTIVES:**

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

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

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Human values, ethical practice and communication abilities

### **KNOWLEDGE:**

- Demonstrate understanding of basic sciences relevant to speciality.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problems within the speciality in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognise conditions that may be outside the area of speciality/competence and to refer them to an appropriate specialist.
- Update knowledge by self study and by attending courses, conferences and seminars relevant to speciality.
- Undertake audit, use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

### **SKILLS:**

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

### **HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES:**

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

### **SPECIALITIES FOR THE MDS DEGREE:**

- i) Prosthodontics and Crown & Bridge
- ii) Periodontology
- iii) Oral & Maxillofacial Surgery
- iv) Conservative Dentistry and Endodontics
- v) Orthodontics & Dentofacial Orthopedics
- vi) Oral Pathology & Microbiology
- vii) Public Health Dentistry
- viii) Paedodontics & Preventive Dentistry
- ix) Oral Medicine & Radiology

### **DEFINITIONS OF VARIOUS SPECIALITIES:**

#### **1. Prosthodontics and Crown & Bridge**

Prosthodontics and Crown & Bridge and Oral Implantology is that branch of Dental art and science pertaining to the restoration and maintenance of oral function, health, comfort and appearance by the replacement of missing or lost natural teeth and associated tissues either by fixed or removable artificial substitutes.

#### **2. Periodontology**

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

**3. Oral & Maxillofacial Surgery**

Oral and Maxillofacial surgery and Implantology deals with the diagnosis and surgical and adjunctive treatment of diseases, injuries and defects of the human jaws and associated oral and facial structures.

**4. Conservative Dentistry and Endodontics**

Conservative dentistry deals with prevention and treatment of the diseases and injuries of the hard tissues and the pulp of the tooth and associated periapical lesions.

**5. Orthodontics and Dentofacial Orthopedics**

Deals with prevention and correction of oral anomalies and malocclusion and the harmonizing of the structures involved, so that the dental mechanisms will function in a normal way.

**6. Oral Pathology & Microbiology**

Oral Pathology deals with the nature of oral diseases, their causes, processes and effects. It relates the clinical manifestation of oral diseases to the physiologic and anatomic changes associated with these diseases.

**7. Public Health Dentistry**

Community Dentistry is the science and art of preventing and controlling Dental diseases and promoting Dental health through organized community efforts.

**8. Paedodontics and Preventive Dentistry**

Deals with prevention and treatment of oral and Dental ailments that may occur during childhood.

**9. Oral Medicine and Radiology**

Oral Medicine is that speciality of dentistry concerned with the basic diagnostic procedures and techniques useful in recognizing the diseases of the oral tissues of local and constitutional origin and their medical management.

Radiology is a science dealing with x-rays and their uses in diagnosis and treatment of diseases in relation to orofacial diseases.

**SECTION-III****TEACHING AND LEARNING ACTIVITIES**

All the candidates registered for MDS course in various specialities shall pursue the course for a period of three years as fulltime students. During this period each student shall take part actively in learning and teaching activities designed by the institution / university. The council desires the following teaching and learning activities in each speciality.

**1. LECTURES:**

There shall be some didactic lectures in the speciality and in the allied fields. The postgraduate departments should encourage the guest lectures in the required areas to strengthen the training programmes. It is also desirable to have certain integrated lectures by multidisciplinary teams on selected topics.

**2. JOURNAL CLUB:**

The journal review meetings shall be held at least once a week. All trainees are expected to participate actively and enter relevant details in logbook. The trainee should make presentations from the allotted journals of selected articles at least 5 times in a year.

**3. SEMINARS:**

The seminars shall be held at least twice a week in each postgraduate department. All trainees are expected to participate actively and enter relevant details in logbook. Each trainee shall make at least 5-seminar presentation in each year.

**4. SYMPOSIUM:**

It is recommended to hold symposium on topics covering multiple disciplines.

**5. CLINICAL POSTINGS:**

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.

**6. CLINICO PATHOLOGICAL CONFERENCE:**

The clinico pathological conferences should be held once in a month involving the faculties of oral medicine and radiology, oral pathology and concerned clinical department. The trainees should be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

**7. INTERDEPARTMENTAL MEETINGS:**

To bring in more integration among various specialities there shall be interdepartmental meeting chaired by the dean with all heads of postgraduate departments at least once a month.

**8. TEACHING SKILLS:**

All the trainees shall be encouraged to take part in undergraduate teaching programmes either in the form of lectures or group discussions.

**9. CONTINUING DENTAL EDUCATION PROGRAMMES:**

Each postgraduate department shall organize these programmes on regular basis involving the other institutions. The trainees shall also be encouraged to attend such programmes conducted elsewhere.

**10. CONFERENCES / WORKSHOPS / ADVANCED COURSES:**

The trainees shall be encouraged not only to attend conference/workshops/advance courses but also to present at least two papers at state/national speciality meetings during their training period.

**11. ROTATION & POSTING IN OTHER DEPARTMENTS:**

To bring in more integration between the speciality and allied fields each postgraduate department shall workout a programme to rotate the trainees in related disciplines.

**12. DISSERTATION/THESIS:**

The council appreciates the importance of research activities for the growth of the profession. Trainees shall prepare a dissertation based on the clinical or experimental work or any other study conducted by them under the supervision of the postgraduate guide.

**CHECKLISTS AND LOGBOOKS:****CHECKLIST - 1****MODEL CHECK LIST FOR EVALUATION OF JOURNAL REVIEW PRESENTATIONS.**

Name of the Trainee :

Date :

Name of the Faculty / Observer :

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Article chosen was					
2	Extent of understanding of scope & objectives of the paper by the candidate.					
3	Whether cross-references have been consulted.					
4	Whether other relevant publications consulted.					
5	Ability to respond to questions on the paper / subject.					
6	Audio - Visual aids used.					
7	Ability to defend the paper.					

8	Clarity of presentation.					
9	Any other observation.					
<b>Total Score</b>						

**CHECKLIST - 2**

**MODEL CHECK LIST FOR EVALUATION OF SEMINAR PRESENTATIONS**

Name of the Trainee :

Date :

Name of the Faculty / Observer :

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Whether other relevant publications consulted.					
2	Whether cross-references have been consulted.					
3	Completeness of Preparation.					
4	Clarity of presentation.					
5	Understanding of subject.					
6	Ability to answer the questions.					
7	Time scheduling.					
8	Appropriate use of Audio - Visual aids.					
9	Overall performance.					
10	Any other observation.					
<b>Total Score</b>						

**CHECKLIST - 3**

**MODEL CHECK LIST FOR EVALUATION OF CLINICAL WORK IN OPD**

(To be completed once a month by respective Unit Heads including posting in other department)

Name of the Trainee :

Date :

Name of the Unit Head :

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Regularity of attendance.					
2	Punctuality.					
3	Interaction with colleagues and supportive staff.					
4	Maintenance of case records.					
5	Presentation of cases.					
6	Investigations work up.					
7	Chair-side manners.					
8	Rapport with patients.					
9	Over all quality of clinical work.					
<b>Total Score</b>						



**CHECKLIST - 4****EVALUATION FROM THE CLINICAL CASE PRESENTATION**

Name of the Trainee :

Date :

Name of the Faculty / Observer :

Sl. No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Completeness of history.					
2	Whether all relevant points elicited.					
3	Clarity of presentation.					
4	Logical order.					
5	Mentioned all positive and negative.					
6	Accuracy of general physical examination.					
7	Diagnosis: Whether it follows logically from history and findings.					
8	Investigations required.					
	Complete list.					
	Relevant order.					
	Interpretation of investigations.					
9	Ability to react to questioning Whether it follows logically from history and findings.					
10	Ability to defend diagnosis.					
11	Ability to justify differential diagnosis.					
12	Others.					
	<b>Grand Total</b>					

Please use a separate sheet for each faculty member.

**CHECKLIST 5****MODEL CHECK LIST FOR EVALUATION OF TEACHING SKILL**

Name of the Trainee :

Date :

Name of the Faculty / Observer :

Sl. No.		Strong Point	Weak Point
1	Communication of the purpose of the talk		
2	Evokes audience interest in the subject.		
3	The introduction.		
4	The sequence of ideas.		
5	The use of practical examples and / or illustrations.		
6	Speaking style (enjoyable, monotonous, etc. Specify)		
7	Attempts audience participation.		
8	Summary of the main points at the end.		
9	Asks questions.		
10	Answers questions asked by the audience.		
11	Rapport of speaker with his audience.		
12	Effectiveness of the talk.		
13	Uses AV aids appropriately.		

**CHECKLIST - 6**

**MODEL CHECKLIST FOR DISSERTATION PRESENTATION**

Name of the Trainee :

Date :

Name of the Faculty / Observer :

Sl. No.	Prints to be considered.	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Interest shown in selecting topic.					
2	Appropriate review.					
3	Discussion with guide and other faculty.					
4	Quality of protocol.					
5	Preparation of Proforma					
	<b>Total Score</b>					

**CHECKLIST - 7**

**CONTINUOUS EVALUATION OF DISSERTATION WORK BY GUIDE / CO-GUIDE**

Name of the Trainee :

Date :

Name of the Faculty / Observer :

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

**CHECKLIST - 8**

**OVERALL ASSESSMENT SHEET**

Date :

Sl. No.	Faculty Member	Name of trainee and Mean Score									
		A	B	C	D	E	F	G	H	I	J
1											
2											
3											
4											
5											
6											

Signature of HOD

Signature of Principal

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

**KEY:**

**Faculty member :** Name of the faculty doing the assessment.

**Mean score :** Is the sum of all the scores of checklists 1 to 7.

**A, B,..... :** Name of the trainees.

**LOG BOOK****TABLE 1****ACADEMIC ACTIVITIES ATTENDED**

Name :

Admission Year:

College :

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

**TABLE 2****ACADEMIC PRESENTATIONS MADE BY THE TRAINEE**

Name :

Admission Year:

College :

Date	Topic	Type of activity Specify Seminar, Journal club, presentation, UG teaching etc.

**TABLE 3****DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED**

Name:

Admission Year:

College:

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

**Key:**

O-Washed up and observed-Initial 6 months of admission

A-Assisted a more senior surgeon-I year MDS

PA- Performed procedure under the direct supervision of a senior surgeon-II year MDs

PI- Performed independently -III year MDS

**SECTION-IV****LIBRARY & EQUIPMENT REQUIREMENTS****MINIMUM REQUIREMENT OF THE BOOKS AND JOURNALS:**

Books constitute an important component of postgraduate training programmes. The council recommends that all the institutions training postgraduate students should procure all essential books pertaining to the speciality and allied fields. The council recommends that all the institutions update books with new editions from time to time and procure new volumes as and when they are published.

In addition to books and journals in the library, Internet, CDs, Audio Visual facilities should be available.

#### EQUIPMENT REQUIREMENTS (SPECIALITY WISE):

The Council recognizes the importance of proper equipments in the training programmes particularly at postgraduate studies and recommends that all postgraduate departments in Dental Institutions possess standard equipments available in the market preferably approved by competent agencies like ISI etc.

All requirements given are for minimum two admissions. The equipment requirements shall increase corresponding to the number of increase in admissions.

#### DEPARTMENT: Prosthodontics and Crown & Bridge

NAME	SPECIFICATION	QTY.
Electrical Dental Chairs and Units	With shadowless lamp, spittoon, 3 way syringe, instrument tray and suction, micromotor, airtor	6
Articulators – Semi adjustable/ Adjustable (2 of different make)	With Face-bow	6
Hightorque Airtor & Airmotor Handpieces		6
Micromotor – (Lab Type)/C Can be attached (fixed) to wall like marathon	(One per 2 chairs)	2
Ultrasonic Scaler :- Atlest 3-4 no. of chairs C Scales attached		2
Light Cure:- One/Two students		2
Sterilization:-		1+1
Autoclave, Bite Register Wax.		1+1
Surveyor		2+1
Refrigerator, Post System		1
X-ray viewer one with each chair		1
Pneumatic, Crown bridge remove		2
Needle destroyer		2
Dental Cements: GIC, ZOE, Resin		
Crown prep kit – 6	Curing	
Composite Kit	Silicone for Max for Prosthetic	
Polishing Kit	I/O Magnets	
<b>CLINICAL LAB FOR PROSTHETICS</b>		
Plaster Dispenser		2
Model Trimmer with Carborandum Disc		1
Model Trimmer with Diamond Disc		1
Speed Controlled Lathe		2
Vibrator		1+1
Acrylizer – Program. for diff. curing Cycle		1+2
Dewaxing Unit		1+2
Hydraulic Press		1
Mechanical Press	Equipment for microwave curing (CD or RPD)	1
Vacuum Mixing machine		1
Micro motor lab type		2
Curing pressure pot		1+2
Pressure molding machine		1
Denture Base Resin of different color & impact streth Dentive teeth		
<b>Chrome – Cobalt Lab Equipment</b>		
Duplicator	Sprne Wax of diff. Sizes	1+1
Pindex System	Metal (Alloy) for Castings	1+2
Burn-out furnace	Proth. (PFM) All metal 'M' Cast Partial 'D'	2

Welder	Ring Linure	1
Sandblaster (micro & macro)	Casting Ring of diff. Size	2
Electro - Polisher	Crucible fan	1
Model Trimmer with Carborandum Disc	Investment mat for ring 'n' ringless system	1
Model Trimmer with Diamond Disc		1
Model Trimmer with Double disc one Carborandum and one Diamond Disc		1
Casting Machine.Motor Cast with the safety door closure Gas blow torch with Regulator		1
Dewaxing Furnace		1
Induction Casting Machine with Vacuum pump, capable of casting Titanium Chrome Cobalt precision Metal		1
Fully Programmable Porcelain Furnace with Vacuum pump (for ceramic lab)		1
Spot Welder with Soldering, attachment of Cable		1
Metal Polishing Kit		1
Vacuum Mixing Machine		1
Steam Cleaner		1
Spindle Grinder 24,000 RPM with Vacuum Suction		1
Wax Heater		2
Wax Carver (Fully PKT Set)		2+1
Curing Pressure Pot		1
Pressure Moulding Machine		1
Milling Machine		1
Stereo Microscope		1
Magnifying Work Lamp		1
Heavy duty lathe with suction C denture polishing attachment		1
Preheating furnace		1
Dry model Trimmer		1
Die cutting machine/pindex system already mentioned		2
Ultrasonic cleaner		1
Composite curing unit		1
Surveyor		2
<b>Ceramic Lab Equipment</b>		
Ceramic Furnace - fully programmable	One All Ceramic System	2
Ceramic Kit (instruments)		6
Ceramic Materials		
Ceramic Polishing Kit		
<b>Implant Equipment</b>		
Implant Kit/Physio dispenser		2
Implants/Implant Software of all sizes		25
Prosthetic Components		25
Unit Mount Light Cure		2
Pneumatic / Electrical Crown remover		2
X-ray Viewer		2
Needle Destroyer		2
Ultrasonic Cleaner		1
Micro Surveyor		1
Autoclave/Programmable for all recommended cycles		1
Camera		1
Electrical Dental chairs and Units		1
		2

Strengthen Unit		1
X-ray Machine/One chair RVG equipped		1
Refrigerator		1
Surgical Kit/Prosthetic Kit		2
Sinus lift instruments		1
Educating Models		
Implant Removing instrument		
I/O Camera		
Airotan HP/umotor		

**DEPARTMENT: Periodontology**

NAME	SPECIFICATION	QTY.
Dental Chairs and Units	Electrically operated with shadowless lamp, spittoon, 3 way syringe, instrument tray and suction, micromotor, ultrasonic scaler	6
<b>Sterilization Instruments</b>		
Klave (Front Loading)		1
Auto Clave (Fully Automatic)		1
Steel bin		4
<b>Diagnostic instruments</b>		
W.H.O Probe		1
Nabers Probe		1
Williams Probe		1
Newman's Probe		1
Gold Man Fox Probe		1
Marquis color coded Probe		1
<b>Oral prophylaxis Instruments</b>		
Supra gingival scalars	set	2
Sub gingival scalars	set	2
<b>Surgical Instruments</b>		
Routine Surgical Instrument kit	set	2
Surgery Trolleys		6
Electro surgery unit		1
<b>Special surgical Instruments</b>		
Kirkland's Knife	set	1
Bucks Knife	set	1
Orban Knife	set	1
Paquette Blade Handle		1
Pocket Marker Krane Koplun	set	1
Mc calls universal curettes	set	1
Graceys curettes	set	1
Tissue Nipper		1
Cumine Scalar		1
<b>Osseous Surgical Instruments</b>		
Mallet		1
Oschinbain Chisel		1
Schluger Bone File		1
Bone File		1
Bone regenerative materials	Bone graft and GTR membranes Depending on need	
<b>Microsurgical Instruments</b>		
Micro Needle Holder		1
Micro Scissor		1
Magnifying Glass		1

<b>Miscellaneous Instruments</b>		
Composite Gun		
Iontophoretic Unit		
Prophy JET		
Fibre Splint		
Pulp Tester		
Implant Kit		
Physiodesperor		
Airrotar Handpiece		
St & Contraangle Micranote, Gandpece		2
Computer		2
Ultrasonic Cleaner		
X-Ray Viewer		

**DEPARTMENT: Oral & Maxillofacial Surgery**

NAME	SPECIFICATION	QTY.
Dental Chairs and Units	Electrically operated with shadowless lamp, spittoon, 3 way syringe, instrument tray and high vacuum suction, micromotor / Air motor	6
Autoclave	Front loading	2
Fumigators		1
Oscillating saw	With all hand pieces	1
<b>Surgical instruments</b>		
a. General surgery kit including tracheotomy kit		2
b. Minor oral surgery kit		5
c. Osteotomy kit		1
d. Cleft surgery kit		1
e. Bone grafting kit		1
f. Emergency kit		1
g. Trauma set including bone plating kit		2
h. Implant logy kit		1
Distraction osteogenesis kit (desirable)		1
Operating microscope and Microsurgery kit (desirable)		1
Dermatomes		2
Formalin chamber		1
Pulse oxymeter		1
Ventilator		1
Major operation theatre with all facilities		1
Recovery & I.C.U. with all necessary life support equipments		2beds
Fibrooptic light		1
Inpatient beds		20

**DEPARTMENT : Conservative Dentistry and Endodontics**

NAME	SPECIFICATION	QTY
Dental Chairs and Units	Electrically operated with shadowless lamp, spittoon, 3 way syringe, instrument tray and suction, micromotor, airotor, lightcure, Scaler Ultrasonic	6
ENDOSONIC HANDPIECES - Physiosaline equipments, Micro Endosonic Tips, Retro Treatment		2

Mechanized rotary instruments including hand pieces and hand instruments various systems		3
Glass bead sterilizers for each chair		3
Autoclaves for bulk instrument sterilization Vacuum (Front Loading + Fully Automatic)		2
Autoclaves for hand piece sterilization		2
Apex locators 4 <sup>th</sup> generation + upwards		2
Equipments for injectable thermoplasticized gutta percha - 2		2
Pressurized local anaesthesia system		2
Operating microscopes - Steroscopic Distance (22-25 mm)	Inclinabliment	2
Pickling kits		2
Surgical endo kits (Microsurgery)		2
Low speed high torque motors		2
Torque control hand pieces		2
torque control hand pieces		2
Hu Freidy set of hand instruments (FDA Approved quality)		2
Hu Freidy sterilizer trays		4
Variable Intensity Polymerization equipments VLC units, build quality & technical performance ase conforable to eg		2
Conventional VLC units		1
LCD projector with computer - basic system with printer and scanner (TMA attachment)		1
Over head projector		1
Slide projector		2
Clinical micro motors		2
High speed hand pieces		2
Composite kits with different shades and polishing kits		3
Ceramic finishing kits, Metalfinishing kits		2
Amalgam finishing kits		2
X-ray Machine & RVG with all size sensors (0,1,2) FDA approved		

**LABORATORY EQUIPMENT**

Equipments for casting procedures		1
Equipments for ceramics including induction casting machines/ burnout preheat furnaces/ wax elimination furnaces		1
Lab micro motor/ metal grinders / sand blasters/ polishing lathes/ duplicator equipment/ vacuum investment equipments		1 Set
Stielgitz pliers set, microscope assted surgery kits		
Operating microscopes to be fitted with line surgery relay options occurding options		
Instrument retrival kits		

**DEPARTMENT : Orthodontics and Dentofacial Orthopedics**

NAME	SPECIFICATION	QTY.
Dental Chairs and Unit	Electrically operated with shadowless lamp, spittoon, 3 way syringe, instrument tray and suction	6



Vacuum Moulding/Pressure Moulding Unit	1
Hydrogen Soldering Unit	1
Lab Micromotor	4
Spot Welders	4
Model Trimmer (Double Disc)	2
Light Curing Unit	2
Polishing Lathes	2
Tracing Tables	3
Digital Camera	1
Computers with all accessories	1
Scanner with transparency adapter	1
X-ray Viewer	5
O.H.P.	1
Slide Projector (35 mm) / LCD Projector	1
Autoclave - microprocess based	1
High & Low Cycle, Dry Heat Sterilizer	
Ultrasonic Scaler	1
Sets of Orthodontic Pliers	3 Sets
Orthodontic Impression trays	4 Sets
Ultrasonic tray cleaner	1
Typodonts with full teeth set	6
Anatomical Articulator with face bow attachments	1
Three Plane Articulators	1
Hinge Articulators	5
Computer Software for Cephalometries	

**DEPARTMENT : Oral Pathology & Microbiology**

NAME	SPECIFICATION	QTY
<b>Essential Equipment</b>		
Dental Chairs and Units	Electrically operated with shadowless lamp, spittoon, 3-way syringe, instrument tray and suction	1
Adequate laboratory glassware's as required for processing of biopsy specimens & staining.		
Tissue capsules / Tissue embedding cassettes		
Paraffin wax bath (thermostatically controlled)		
Leuchart pieces, Block holders		
Semi automatic microtome		1
Automatic Microtome knife Sharpner		1
Tissue floatation water bath (thermostatically controlled)		1
Slide warming table		1+1
Steel slide racks for staining		1+2
Diamond glass marker		2
Research microscope with phase contrast, dark field, polarization, CCTV & photomicrography attachments		1
Binocular Compound Microscope		4
Electronic dispensing machine		1
Aluminum slide trays		4
Wooden/Plastic slide boxes		4
Wax block storing cabinet		1+2
Slide storing cabinet		1+2
Refrigerator		1
Micropipettes		

**DESIRABLE EQUIPMENT**

Cryostat		1
Fluorescent Microscope		1
Computer with printer		1
Image analysis software		1
Automatic processing equipment		1
Hard tissue microtome		1
Stereo microscope		1
Tissue storing cabinet (Frozen state)		1
Microwave		1

**DEPARTMENT : Public Health Dentistry**

NAME	SPECIFICATION	QTY.
<b>Instruments in the department for comprehensive oral health care programme</b>		
Dental chairs	Electrically operated with shadowless lamp, spittoon, 3 way syringe, Micro motor, Aerator, scalar, light cure unit instrument tray and suction	6
Extraction forceps		6 sets
Filling instruments		6 sets
Scaling instruments	Super gingival scaling	6 sets
Prosthetic instruments		6 sets
Amalgamator		6 sets
Pulp tester		2
Autoclave		2
Sterilizer		2
X-ray viewer		2
Instrument cabinet		1
Overhead Projector		1
Slide projector		1
LCD or DLP multimedia projector		2
Computer, Printer and UPS instruments.		1
		2
<b>For peripheral Dental care or Field programme</b>		
Staff bus		1
Mobile dental clinic fitted with at least 2 dental chairs with complete dental unit		1
Ultrasonic scalar, compressor		1
Generator		1
Public address system, audio-visual aids		1
Television		1
VCR		1
Instrument cabinet, emergency medicine kits, BP Apparatus		1
Portable oxygen cylinder portable chair		1

**DEPARTMENT : Paedodontics and Preventive Dentistry**

NAME	SPECIFICATION	QTY.
Dental Chairs and Units	With shadowless lamp, spittoon, 3 way syringe, instrument tray and suction, micromotor, airtor, lightcure	6
Pedo extraction forceps sets		4
Autoclave	Front loading	1
Intra oral X-ray		1

Automatic developer		1
Pulp Tester		2
Apex Locator		1
Rubber Dam Kit		6
Glass bead sterilizer		3
Orthodontic Welder		1
Ultrasonic Scalars		2
Needle Destroyer		3
Ultrasonic Cleaner		2
X-ray Viewer		2
Amalgamator		2
Plaster Dispenser		2
Dental Lathe		1
Vibrator		1
Brassico Typodonts		6
<b>Minor oral surgery instruments</b>		
Soldering unit		1
Band benching peck pliers		2 Sets
Counterung pliers		2
Crown crimping pliers		2
Double beak pliers Anterior and posterior on		2

**DEPARTMENT: Oral Medicine and Radiology**

NAME	SPECIFICATION	QTY.
Dental Chairs and Units	Electrically operated with shadowless lamp, spittoon, 3 way syringe, instrument tray and suction	6
Intra Oral Radiography Machine (FDA Approved)	55-70 kVp with Digital Compatibility	1
Extra Oral Radiography machine	100 kVp	1
Panoramic Radiography (OPG) Machine with TMJ, MAX, S.N.U.S, Implants view	Digital Compatibility	1
Intra-Oral Camera		1
Pulp Tester		2
Autoclave		2
Punch Biopsy Tool		2
Biopsy Equipment		2
Surgical Trolley		2
Emergency Medicines Kit		1
Extra Oral Cassettes with Intensifying Screens (Conventional & Rare Earth)		4
Lead Screens		2+1
Lead Aprons		2
Lead Gloves		2
Radiographic Filters (Conventional & Rare Earth)		1
Dark Room with Safe light facility		1
Automatic Radiographic Film Processors		2
Radiographic film storage Lead Containers		1
Radio Visoraph, RVG System, Sensor - all sizes (0,1,2)		
Thyroid probes		
Digital Spring nano meter		
Digital Force (N,kg)		
Digital Blood Glucose tester		
Digital Camera		
X-ray Viewer boxes		2

Lacrimial Probes		
Sialography Cannula		2 sets
Computer with color printer		2 sets
Illuminated Mouth Mirror & Probe		1
		2

**SECTION-V****SYLLABUS FOR M.D.S. IN VARIOUS SPECIALTIES****APPLIED BASIC SCIENCES:**

The MDS Course in Applied Basic Sciences shall vary according to the particular speciality, similarly the candidates shall also acquire adequate knowledge in other subjects related to their respective speciality.

**Applied Basic Sciences optional subjects:**

- (i) Applied Anatomy
- (ii) Applied Physiology
- (iii) Applied Pathology

**Subjects related to different specialities:**

1. Bio-statistics
2. Nutrition and Dietetics
3. Teaching and Testing Methodology
4. Research Methodology
5. Psychology and Practice Management
6. Comparative Anatomy
7. Genetics Growth and Development
8. Applied Chemistry including Metallurgy, Dental Materials.

**I. PROSTHODONTICS AND CROWN & BRIDGE****AIM:**

To train dental graduates so as to ensure higher competence in both general and special areas of Prosthodontics and prepare a candidate for teaching, research and clinical abilities, including prevention and after care in prosthodontics including crown and bridge and implantology.

**GENERAL OBJECTIVES OF THE COURSE:**

- Training programme in Prosthetic dentistry including Crown & Bridge & Implantology is structured to achieve knowledge and skill in theoretical and clinical laboratory, attitude, communicative skills and ability to research with understanding of social, cultural, educational and environmental background of the society.
- To have acquired adequate knowledge and understanding of applied basic and systemic medical science, knowledge in general and particularly of head and neck.
- The postgraduates will be able to provide Prosthodontic therapy for patients with competence and working knowledge with understanding of applied medical, behavioral and clinical science, that are beyond the treatment skills of the general BDS graduate and MDS graduate of other specialities, to demonstrate evaluative and judgment skills in making appropriate decisions regarding prevention, treatment, after care and referral to deliver comprehensive care to patients.

**KNOWLEDGE:**

The candidate should possess knowledge of applied basic and systemic medical sciences.

- On human anatomy, embryology, histology, applied in general and particularly to head and neck, Physiology & Biochemistry, Pathology and Microbiology, virology, health and diseases of various systems of the body (systemic) principles in surgery and medicine, pharmacology, nutrition, behavioral science, age changes, genetics, Immunology, Congenital defects and syndrome and Anthropology, Bioengineering, Bio-medical and Biological Principle and applications to Dental material science.
- Ability to diagnose and planned treatment for patients requiring a Prosthodontic therapy

- Ability to read and interpret a radiograph and other investigations for the purpose of diagnosis and treatment plan.
- Tooth and tooth surface restorations, Complete denture Prosthodontics, removable partial denture Prosthodontics, fixed prosthodontics and maxillofacial and Craniofacial Prosthodontics, implants and implant supported Prosthodontics, T.M.J. and occlusion, craniofacial esthetic, and biomaterials, craniofacial disorders, problems of psychogenic origin.
- Age changes and Prosthodontic Therapy for the aged.
- Ability to diagnose failed restoration and provide Prosthodontic therapy and after care.
- Should have essential knowledge on ethics, laws and Jurisprudence and forensic odontology in Prosthodontics.
- General health conditions and emergency as related to prosthodontics treatment.
- Identify social, cultural, economic, environmental, educational and emotional determinants of the patient and consider them in planning the treatment.
- Identify cases, which are outside the area of his speciality/ competence and refer them to appropriate specialists.
- Advice regarding case management involving surgical, interim treatment etc.
- Competent specialization in team management of craniofacial design.
- To have acquired adequate knowledge and understanding of applied basic and systematic medical science knowledge in general and particular to head and neck.
- Should attend continuing education programmes, seminars and conferences related to Prosthodontics, thus updating himself.
- Teach and guide his/her team, colleague and other students.
- Should be able to use information technology tools and carry out research both basic and clinical, with the aims of publishing his/ her work and presenting his/her work at various scientific forums.
- Should have essential knowledge of personal hygiene, infection control, prevention of cross infection and safe disposal of waste, keeping in view the risks of transmission of Hepatitis and HIV.
- Should have an ability to plan to establish Prosthodontics clinic/hospital teaching department and practice management.
- Should have a sound knowledge for the application of pharmacology. Effects of drugs on oral tissue and systems of a body and for medically compromised patients.
- The postgraduates will be able to provide Prosthodontic therapy for patients with competence and working knowledge with understanding of applied medical behavioral and clinical science that are beyond the treatment skills of the general BDS graduate and MDS graduate of other specialities to demonstrate, evaluative and judgment skills in making appropriate decisions regarding prevention, treatment after care and referral to deliver comprehensive care to patients.

**SKILLS:**

- The candidate should be able to examine the patients requiring Prosthodontics therapy, investigate the patient systemically, analyze the investigation results, radiography, diagnose the ailment, plan a treatment, communicate it with the patient and execute it.
- Understand the prevalence and prevention of diseases of craniomandibular system related to Prosthetic dentistry.
- The candidate should be able to restore lost functions of stomatognathic system namely mastication, speech, appearance and psychological comforts. By understanding biological, biomedical, bioengineering principles and systemic condition of the patient to provide a quality health care of the craniofacial region.
- The candidate should be able to interact with other speciality including medical speciality for a planned team management of patients for a craniofacial and oral acquired and congenital defects, temporomandibular joint syndromes, esthetics, Implant supported Prosthetics and problems of Psychogenic origin,
- Should be able to demonstrate the clinical competence necessary to carry out appropriate treatment at higher level of knowledge, training and practice skills currently available in their specialty area.
- Identify target diseases and awareness amongst the population for Prosthodontic therapy.

- Perform clinical and Laboratory procedure with understanding of biomaterials, tissue conditions related to prosthesis and have competent dexterity and skill for performing clinical and laboratory procedures in fixed, removable, implant, maxillofacial, TMJ and esthetics Prosthodontics.
- Laboratory technique management based on skills and knowledge of Dental Materials and dental equipment and instrument management.
- To understand demographic distribution and target diseases of Cranio mandibular region related to Prosthodontics.

**ATTITUDES:**

- Adopt ethical principles in all Prosthodontic practice. Professional honesty and integrity are to be fostered. Treatment to be delivered irrespective of social status, caste, creed or religion of patient.
- Willing to share the knowledge and clinical experience with professional colleagues.
- Willing to adopt new methods and techniques in prosthodontics from time to time based on scientific research, which is in patient's best interest.
- Respect patient's rights and privileges including patients right to information and right to seek second opinion.

**COMMUNICATIVE ABILITIES:**

- Develop communication skills, in particular, to explain treatment option available in management.
- Provide leadership and get the best out of his group in a congenial working atmosphere.
- Should be able to communicate in simple understandable language with the patient and explain the principles of prosthodontics to the patient. He should be able to guide and counsel the patient with regard to various treatment modalities available.
- Develop the ability to communicate with professional colleagues through various media like Internet, e-mail, videoconference, and etc. to render the best possible treatment.

**COURSE CONTENTS:**

The candidates shall under go training for 3 academic years with satisfactory attendance of 80% for each year.

- The course includes epidemiology and demographic studies, research and teaching skills.
- Ability to prevent, diagnose and treat with after care for all patients for control of diseases and / or treatment related syndromes with patient satisfaction for restoring functions of Stomatognathic system by Prosthodontic therapy

The program out line addresses the knowledge, procedural and operative skills needed in Masters Degree in Prosthodontics. A minimum of 3 years of formal training through a graded system of education as specified will enable the trainee to achieve Masters Degree in Prosthodontics including Crown & Bridge and Implantology, competently and have the necessary skills/ knowledge to update themselves with advancements in the field. The course content has been identified and categorized as Essential knowledge as given below.

**ESSENTIAL KNOWLEDGE:**

The topics to be considered are: Basic Sciences, Prosthodontics including Crown and Bridge Implantology and Material Science.

**APPLIED BASIC SCIENCES:**

- A thorough knowledge on the applied aspects of Anatomy, Embryology, Histology particularly to head and neck, Physiology, Biochemistry, Pathology, Microbiology, Virology.
- Pharmacology, Health and systematic diseases principles in surgery medicine and Anesthesia, Nutrition, Behavioral sciences, age changes, genetics, Dental Material Science, congenital defects and Syndromes and Anthropology, Biomaterial Sciences, Bio-engineering and Bio-medical and Research Methodology as related to Masters degree prosthodontics including crown & bridge and implantology

It is desirable to have adequate knowledge in Bio-statistics, Research Methodology and use of computers. To develop necessary teaching skills in Prosthodontics including crown and bridge and Implantology.

**APPLIED ANATOMY OF HEAD AND NECK:**

**General Human Anatomy** – Gross Anatomy, anatomy of Head and Neck in detail. Cranial and facial bones, TMJ and function, muscles of mastication and facial expression, muscles of neck and back including muscles of deglutition and tongue, arterial supply and venous drainage of the head and neck, anatomy of the Para nasal sinuses with relation to the V<sup>th</sup> cranial nerve. General consideration of the structure and function of the brain. Brief considerations of V, VII, XI, XII, cranial nerves and autonomic nervous system of the head and neck. The salivary glands, Pharynx, Larynx Trachea, Esophagus, Functional Anatomy of mastication, Deglutition, speech, respiration, and circulation, teeth eruption, morphology, occlusion and function. Anatomy of TMJ, its movements and myofascial pain dysfunction syndrome

**Embryology** – Development of the face, tongue, jaws, TMJ, Paranasal sinuses, pharynx, larynx, trachea, esophagus, Salivary glands, Development of oral and Para oral tissue including detailed aspects of tooth and dental hard tissue formation

**Growth & Development** – Facial form and Facial growth and development overview of Dentofacial growth process and physiology from fetal period to maturity and old age, comprehensive study of craniofacial biology. General physical growth, functional and anatomical aspects of the head, changes in craniofacial skeletal, relationship between development of the dentition and facial growth.

**Dental Anatomy** – Anatomy of primary and secondary dentition, concept of occlusion, mechanism of articulation, and masticatory function. Detailed structural and functional study of the oral dental and Para oral tissues. Normal occlusion, development of occlusion in deciduous mixed and permanent dentitions, root length, root configuration, tooth-numbering system.

**Histology** – histology of enamel, dentin, Cementum, periodontal ligament and alveolar bone, pulpal anatomy, histology and biological consideration. Salivary glands and Histology of epithelial tissues including glands.

Histology of general and specific connective tissue including bone, hematopoietic system, lymphoid etc.

**Muscle and neural tissues, Endocrinal system** including thyroid, Salivary glands, Histology of skin, oral mucosa, respiratory mucosa, connective tissue, bone, cartilage, cellular elements of blood vessels, blood, lymphatic, nerves, muscles, tongue, tooth and its surrounding structures.

**Anthropology & Evolution** – Comparative study of tooth, joints, jaws, muscles of mastication and facial expression, tongue, palate, facial profile and facial skeletal system. Comparative anatomy of skull, bone, brain, musculo – skeletal system, neuromuscular coordination, posture and gait – plantigrade and orthograde posture.

**Applied Genetics and Heredity** – Principles of orofacial genetics, molecular basis of genetics, genetic risks, counseling, bioethics and relationship to Orthodontic management. Dentofacial anomalies, Anatomical, psychological and pathological characteristic of major groups of developmental defects of the orofacial structures

**Cell biology** – Detailed study of the structure and function of the mammalian cell with special emphasis on ultra structural features and molecular aspects. Detailed consideration of Inter cellular junctions. Cell cycle and division, cell-to-cell and cell- extra cellular matrix interactions.

**APPLIED PHYSIOLOGY AND NUTRITION :**

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance. Blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, capillary and lymphatic circulation, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws. Role of Vit. A, C and B complex in oral mucosal and periodontal health. Physiology and function of the masticatory system. Speech mechanism, mastication, swallowing and deglutition mechanism, salivary glands and Saliva

**ENDOCRINES:**

General principles of endocrine activity and disorders relating to pituitary, thyroid, pancreas, parathyroid, adrenals, gonads, including pregnancy and lactation. Physiology of saliva, urine formation, normal and abnormal constituents, Physiology of pain, Sympathetic and parasympathetic nervous system. Neuromuscular co-ordination of the stomatognathic system.

**APPLIED NUTRITION:**

General principles, balanced diet, effect of dietary deficiencies and starvation, Diet, digestion, absorption, transportation and utilization, diet for elderly patients.

**APPLIED BIOCHEMISTRY:**

General principles governing the various biological activities of the body, such as osmotic pressure, electrolytic dissociation, oxidation-reduction, etc. general composition of the body, intermediary metabolism, Carbohydrates, proteins, liquids and their metabolism, Enzymes, Vitamins, and minerals, Hormones, Blood and other body fluids, Metabolism of inorganic elements, Detoxication in the body, Anti metabolites.

**APPLIED PHARMACOLOGY AND THERAPEUTICS:**

Definition of terminologies used - Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics. Analeptics and tranquilizers, Local anesthetics, Chemotherapeutics and antibiotics, Antitubercular and anti syphilitic drugs, Analgesics and antipyretics, Antiseptics, styptics, Sialogogues and antisialogogues, Haematinics, Cortisone, ACTH, insulin and other antidiabetics vitamins: A, D, B - complex group C and K etc. Chemotherapy and Radiotherapy

**APPLIED PATHOLOGY :**

Inflammation, repair and degeneration, Necrosis and gangrene, Circulatory disturbances, Ischemia, hyperemia, chronic venous congestion, edema, thrombosis, embolism and infarction. Infection and infective granulomas, Allergy and hypersensitive reaction, Neoplasm; Classification of tumors, Carcinogenesis, characteristics of benign and malignant tumors, spread of tumors. Applied histo pathology and clinical pathology.

**APPLIED MICROBIOLOGY:**

Immunity, knowledge of organisms commonly associated with diseases of the oral cavity (morphology cultural characteristics etc) of strepto, staphylo, pneumo, gono and meningococci, Clostridia group of organisms, Spirochetes, organisms of tuberculosis, leprosy, diphtheria, actinomycosis and moniliasis etc. Virology, Cross infection control, sterilization and hospital waste management

**a) Applied Oral Pathology:**

Developmental disturbances of oral and Para oral structures, Regressive changes of teeth, Bacterial, viral and mycotic infections of oral cavity, Dental caries, diseases of pulp and periapical tissues, Physical and chemical injuries of the oral cavity, oral manifestations of metabolic and endocrine disturbances, Diseases of the blood and blood forming organism in relation to the oral cavity, Periodontal diseases, Diseases of the skin, nerves and muscles in relation to the Oral cavity.

**b) Laboratory determinations:**

Blood groups, blood matching, R.B.C. and W.B.C. count, Bleeding and clotting time, Smears and cultures - urine analysis and culture

**BIOSTATISTICS:**

Study of Biostatistics as applied to dentistry and research. Definition, aim characteristics and limitations of statistics, planning of statistical experiments, sampling, collection, classification and presentation of data (Tables, graphs, pictograms etc) Analysis of data.

**INTRODUCTION TO BIOSTATISTICS:**

Scope and need for statistical application to biological data. Definition of selected terms - scale of measurements related to statistics, Methods of collecting data, presentation of the statistical diagrams and graphs.



Frequency curves, mean, mode of median, Standard deviation and co-efficient of variation, Correlation - Co-efficient and its significance, Binominal distributions normal distribution and Poisson distribution, Tests of significance

**RESEARCH METHODOLOGY:**

Understanding and evaluating dental research, scientific method and the behavior of scientists, understanding to logic - inductive logic - analogy, models, authority, hypothesis and causation, Quacks, Cranks, Abuses of Logic, Measurement and Errors of measurement, presentation of results, Reliability, Sensitivity and specificity diagnosis test and measurement, Research Strategies, Observation, Correlation, Experimentation and Experimental design. Logic of statistical interference balance judgements, judgement under uncertainty, clinical vs., scientific judgement, problem with clinical judgement, forming scientific judgements, the problem of contradictory evidence, citation analysis as a Means of literature evaluation, influencing judgement : Lower forms of Rhetorical life, Denigration, Terminal, Inexactitude.

**APPLIED RADIOLOGY:**

Introduction, radiation, background of radiation, sources, radiation biology, somatic damage, genetic damage, protection from primary and secondary radiation, Principles of X-ray production, Applied principles of radio therapy and after care.

**ROENTGENOGRAPHIC TECHNIQUES:**

Intra oral: Extra oral roentgenography, Methods of localization digital radiology and ultra sound, Normal anatomical landmarks of teeth and jaws in radiograms, temporomandibular joint radiograms, neck radiograms.

**APPLIED MEDICINE:**

Systemic diseases and its influence on general health and oral and dental health. Medical emergencies in the dental offices - Prevention, preparation, medico legal consideration, unconsciousness, respiratory distress, altered consciousness, seizures, drug related emergencies, chest pain, cardiac arrest, premedication, and management of ambulatory patients, resuscitation, applied psychiatry, child, adult and senior citizens. Assessment of case, premeditation, inhibition, monitoring, extubation, complication assist in O.T. for anesthesia.

**APPLIED SURGERY & ANESTHESIA:**

General principles of surgery, wound healing, incision wound care, hospital care, control of hemorrhage, electrolyte balance. Common bandages, sutures, splints, shifting of critically ill patients, prophylactic therapy, bone surgeries, grafts, etc, surgical techniques, nursing assistance, anesthetic assistance.

Principles in speech therapy, surgical and radiological craniofacial oncology, applied surgical ENT and ophthalmology.

**PLASTIC SURGERY:**

Applied understanding and assistance in programmes of plastic surgery for prosthodontics therapy.

**APPLIED DENTAL MATERIAL:**

- All materials used for treatment of craniofacial disorders - Clinical, treatment, and laboratory materials, Associated materials, Technical consideration, shelf life, storage, manipulations, sterilization, and waste management.
- Students shall be trained and practiced for all clinical procedures with an advanced knowledge of theory of principles, concepts and techniques of various honorably accepted methods and materials for Prosthodontics, treatment modalities includes honorable accepted methods of diagnosis, treatment plan, records maintenance, and treatment and laboratory procedures and after care and preventive.
- Understanding all applied aspects for achieving physical, psychological well being of the patients for control of diseases and / or treatment related syndromes with the patient satisfaction and restoring function of Cranio mandibular system for a quality life of a patient
- The theoretical knowledge and clinical practice shall include principles involved for support, retention, stability, esthetics, phonation, mastication, occlusion, behavioral, psychological, preventive and social aspects of science of Prosthodontics including Crown & Bridge and Implantology.

- Theoretical knowledge and clinical practice shall include knowledge for laboratory practice and material science. Students shall acquire knowledge and practice of history taking, systemic and oro and Craniofacial region and diagnosis and treatment plan and prognosis record maintaining. A comprehensive rehabilitation concept with pre prosthetic treatment plan including surgical Reevaluation and prosthodontic treatment plan, impressions, jaw relations, utility of face bow and articulators, selection and positioning of teeth for retention, stability, esthetics, phonation and psychological comfort. Fit and insertion and instruction for patients after care and preventive Prosthodontics, management of failed restorations.
- TMJ syndromes, occlusion rehabilitation and craniofacial esthetics. State of the art clinical methods and materials for implants supported extra oral and intra oral prosthesis.
- Student shall acquire knowledge of testing biological, mechanical and other physical property of all material used for the clinical and laboratory procedures in prosthodontic therapy.
- Students shall acquire full knowledge and practice Equipments, instruments, materials, and laboratory procedures at a higher competence with accepted methods.
- All clinical practice shall involve personal and social obligation of cross infection control, sterilization and waster management.

### **I. REMOVABLE PROSTHODONTICS AND IMPLANTS**

- a. Prosthodontic treatment for completely edentulous patients - Complete denture, immediate complete denture, single complete denture, tooth supported complete denture, Implant supported Prosthesis for completely edentulous
- b. Prosthodontic treatment for partially edentulous patients: - Clasp-retained partial dentures, intra coronal and extra coronal precision attachments retained partial dentures, maxillofacial prosthesis.

#### **Prosthodontic treatment for edentulous patients: - Complete Dentures and Implant supported Prosthesis.**

Complete Denture Prosthesis - Definitions, terminology, G.P.T., Boucher's clinical dental terminology

Scope of Prosthodontic - the Cranio Mandibular system and its functions, the reasons for loss of teeth and methods of restorations,

Infection control, cross infection barrier - clinical and laboratory and hospital and lab waste management

- a) Edentulous Predicament, Biomechanics of the edentulous state, Support mechanism for the natural dentition and complete dentures, Biological considerations, Functional and Para functional considerations, Esthetic, behavioral and adaptive responses, Temporomandibular joints changes.
- b) Effects of aging of edentulous patients - aging population, distribution and edentulism in old age, impact of age on edentulous mouth - Mucosa, Bone, saliva, jaw movements in old age, taste and smell, nutrition, aging, skin and teeth, concern for personal appearance in old age
- c) Sequelae caused by wearing complete denture - the denture in the oral environment - Mucosal reactions, altered taste perception, burning mouth syndrome, gagging, residual ridge reduction, denture stomatitis, flabby ridge, denture irritation hyperplasia, traumatic Ulcers, Oral cancer in denture wearers, nutritional deficiencies, masticatory ability and performance, nutritional status and masticatory functions.
- d) Temporomandibular disorders in edentulous patients - Epidemiology, etiology and management, Pharmacotherapy, Physical modalities, and Bio-behavioral modalities
- e) Nutrition Care for the denture wearing patient - Impact of dental status on food intake, Gastrointestinal functions, nutritional needs and status of older adults, Calcium and bone health, vitamin and herbal supplementation, dietary counseling and risk factor for malnutrition in patients with dentures and when teeth are extracted.
- f) Preparing patient for complete denture patients - Diagnosis and treatment planning for edentulous and partially edentulous patients - familiarity with patients, principles of perception, health questionnaires and identification data, problem identification, prognosis and treatment identification data, problem identification, prognosis and treatment planning - contributing history - patient's history, social information, medical status - systemic status with special reference to debilitating diseases, diseases of the

- joint, cardiovascular, disease of the skin, neurological disorders, oral malignancies, climacteric, use of drugs, mental health - mental attitude, psychological changes, adaptability, geriatric changes - physiologic, pathological, pathological and intra oral changes: Intra oral health - mucose membrane, alveolar ridges, palate and vestibular sulcus and dental health.
- Data collection and recording, visual observation, radiography, palpation, measurement - sulci or fossae, extra oral measurement, the vertical dimension of occlusion, diagnostic casts.
- Specific observations - existing dentures, soft tissue health, hard tissue health - teeth, bone
- Biomechanical considerations - jaw relations, border tissues, saliva, muscular development - muscle tone, neuromuscular co-ordination, tongue, cheek and lips.
- Interpreting diagnostic findings and treatment planning
- g) Pre prosthetic surgery - Improving the patients denture bearing areas and ridge relations: - non surgical methods - rest for the denture supporting tissues, occlusal correction of the old prosthesis, good nutrition, conditioning of the patients musculature, surgical methods - Correction of conditions, that preclude optimal prosthetic function - hyperplastic ridge - epulis fissuratum and papillomatosis, frenular attachments and pendulous maxillary tuberosities, ridge augmentation, maxillary and Mandibular oral implants, corrections of congenital deformities, discrepancies in jaw size, relief of pressure on the mental foramen, enlargement of denture bearing areas, vestibuloplasty, ridge augmentation, replacement of tooth roots with C.I. integrated denture implants.
- h) Immediate Denture - Advantages, disadvantages, contra indication, diagnosis, treatment plan and prognosis, Explanation to the patient, Oral examinations, examination of existing prosthesis, tooth modification, prognosis, referrals/adjunctive care, oral prophylaxis and other treatment needs.
- First extraction/surgical visit, preliminary impressions and diagnostic casts, management of loose teeth, custom trays, final impressions and final casts two tray or sectional custom impression tray, location of posterior limit and jaw relation records, setting the denture teeth / verifying jaw relations and the patient try in, laboratory phase, setting of anterior teeth, Wax contouring, flasking and boil out, processing and finishing, surgical templates, surgery and immediate denture insertion, post operative care and patient instructions, subsequent service for the patient on the immediate denture, over denture tooth attachments, implants or implant attachments.
- i) Over dentures (tooth supported complete dentures) - indications and treatment planning, advantages and disadvantages, selection of abutment teeth, loss of abutment teeth, tooth supported complete dentures. Non-coping abutments, abutment with copings, abutments with attachments, submerged vital roots, preparations of the retained teeth.
- j) Single Dentures: Single Mandibular denture to oppose natural maxillary teeth, single complete maxillary denture to oppose natural Mandibular teeth to oppose a partially edentulous Mandibular arch with fixed prosthesis, partially edentulous Mandibular arch with removable partial dentures. Opposing existing complete dentures, preservation of the residual alveolar ridge, necessity for retaining maxillary teeth and mental trauma.
- k) Art of communication in the management of the edentulous predicament - Communication - scope, a model of communication, why communication important, what are the elements of effective communications, special significance of doctor / patient communication, doctor behavior, The iatrosedative (doctor & act of making calm) recognizing and acknowledging the problem, exploring and identifying the problem, interpreting and explaining the problem, offering a solution to the problem for mobilize their resources to operate most efficient way, recognizing and acknowledging the problem, interpreting and explaining the problem, offering a solution to the problem.
- l) Materials prescribed in the management of edentulous patients - Denture base materials, General requirements of base materials for edentulous patients, requirement of an ideal denture base, chemical composition of denture base resins, materials used in the fabrication of prosthetic denture teeth, requirement of prosthetic denture teeth, denture lining materials and tissue conditioners, cast metal alloys as denture bases - base metal alloys.

- m) Articulators - Classification, selection, limitations, precision, accuracy and sensitivity, and Functional activities of the lower member of the articulator and uses,
- n) Fabrications of complete dentures - complete denture impressions - muscles of facial expressions and anatomical landmarks, support, retention, stability, aims and objectives - preservation, support, stability, aesthetics, and retention. Impression materials and techniques - need of 2 impressions the preliminary impression and final impression  
 Developing an analogue / substitute for the maxillary denture bearing area - anatomy of supporting structures - mucous membrane, hard palate, residual ridge, shape of the supporting structure and factors that influence the form and size of the supporting bones, incisive foramen, maxillary tuberosity, sharp spiny process, torus palatinus, Anatomy of peripheral or limiting structures, labial vestibule, Buccal vestibule, vibrating line, preliminary and final impressions, impression making, custom tray and refining the custom tray, preparing the tray to secure the final impression, making the final impression, boxing impression and making the casts  
 Developing an analogue / substitute for the Mandibular denture bearing area -  
 Mandible - anatomy of supporting structure, crest of the residual ridge, the Buccal shelf, shape of supporting structure, mylohyoid ridge, mental foramen, genial tubercles, torus mandibularis, Anatomy of peripheral or limiting structure - labial vestibule, Buccal vestibule, lingual border, mylohyoid muscle, retromylohyoid fossa, sublingual gland region, alveolingual sulcus, Mandibular impressions - preliminary impressions, custom tray, refining, preparing the tray, final impressions.
- o) Mandibular movements, Maxillo mandibular relation and concepts of occlusion - Gnathology, identification of shape and location of arch form - Mandibular and maxillary, occlusion rim, level of occlusal plane and recording of trail denture base, tests to determine vertical dimension of occlusion, interocclusal, centric relation records, Biological and clinical considerations in making jaw relation records and transferring records from the patients to the articulator, Recording of Mandibular movements - influence of opposing tooth contacts, Temporomandibular joint, muscular involvements, neuromuscular regulation of Mandibular motion, the envelope of motion, rest position, Maxillo - Mandibular relations - the centric, eccentric, physiologic rest position, vertical dimension, occlusion, recording methods - mechanical, physiological, Determining the horizontal jaw relation - Functional graphics, tactile or interocclusal check record method, Orientation / sagittal relation records, Arbitrary / Hinge axis and face bow record, significance and requirement, principles and biological considerations and securing on articulators.
- p) Selecting and arranging artificial teeth and occlusion for the edentulous patient - anterior tooth selection, posterior tooth selection, and principles in arrangement of teeth, and factors governing position of teeth - horizontal, vertical. The inclinations and arrangement of teeth for aesthetics, phonetics and mechanics - to concept of occlusion.
- q) The Try in - verifying vertical dimension, centric relation, establishment of posterior palatal seal, creating a facial and functional harmony with anterior teeth, harmony of spaces of individual teeth position, harmony with sex, personality and age of the patient, co-relating aesthetics and incisal guidance.
- r) Speech considerations with complete dentures - speech production - structural and functional demands, neuropsychological background, speech production and the roll of teeth and other oral structures - bilabial sounds, labiodentals sounds, linguodentals sounds, linguoalveolar sound, articulatoric characteristics, acoustic characteristics, auditory characteristics, linguopalatal and linguoalveolar sounds, speech analysis and prosthetic considerations.
- s) Waxing contouring and processing the dentures their fit and insertion and after care - laboratory procedure - wax contouring, flasking and processing, laboratory remount procedures and selective, finishing and polishing. Critiquing the finished prosthesis - doctors evaluation, patients evaluation, friends evaluation, elimination of basal surface errors, errors in occlusion, interocclusal records for remounting procedures - verifying centric relation, eliminating occlusal errors, special instructions to the patient - appearance with new denture, mastication with new dentures, speaking with new dentures, speaking with new dentures, oral hygiene with dentures, preserving of residual ridges and educational material for patients, maintaining the comfort and health of the oral cavity in the rehabilitated edentulous patients. Twenty-four hours oral

- examination and treatment and preventive Prosthodontic – periodontic recall for oral examination 3 to 4 months intervals and yearly intervals.
- t) Implant supported Prosthesis for partially edentulous patients – Science of Osseo integration, clinical protocol for treatment with implant supported over dentures, managing problems and complications, implant Prosthodontics for edentulous patients: current and future directions.
  - u) Implant supported prosthesis for partially edentulous patients – Clinical and laboratory protocol: Implant supported prosthesis, managing problems and complications
    - Introduction and Historical Review
    - Biological, clinical and surgical aspects of oral implants
    - Diagnosis and treatment planning
    - Radiological interpretation for selection of fixtures
    - Radiological interpretation for selection of fixtures
    - Splints for guidance for surgical placement of fixtures
    - Intra oral plastic surgery
    - Guided bone and Tissue generation consideration for implants fixture.
    - Implants supported prosthesis for complete edentulism and partial edentulism
    - Occlusion for implants support prosthesis.
    - Peri-implant tissue and Management
    - Peri – implant and management
    - Maintenance and after care
    - Management of failed restoration.
    - Work authorization for implant supported prosthesis – definitive instructions, legal aspects, delineation of responsibility.

**Prosthodontic treatment for partially edentulous patients – Removable partial Prosthodontics –**

- a. Scope, definition and terminology, Classification of partially edentulous arches – requirements of an acceptable methods of classification, Kennedy's classification, Applegate's rules for applying the Kennedy classification
- b. Components of RPD – major connector – mandibular and maxillary, minor connectors, design, functions, form and location of major and minor connectors, tissue stops, finishing lines, reaction of tissue to metallic coverage
 

Rest and rest seats – from of the Occlusal rest and rest seat, interproximal Occlusal rest seats, internal Occlusal rests, possible movements of partial dentures, support for rests, lingual rests on canines and incisor teeth, incisal rest and rest seat.

Direct retainer- Internal attachment, extracoronary direct retainer, relative uniformity of retention, flexibility of clasp arms, stabilizing – reciprocal clasp are, criteria for selecting a given clasp design, the basic principles of clasp design, circumferential clasp, bar clasp, combination clasp and other type of retainers.

Indirect Retainer – denture rotation about an axis, factors influencing effectiveness of indirect retainers, forms of indirect retainers, auxiliary Occlusal rest, canine extensions from Occlusal rests, canine rests, continuous bar retainers and linguoplates, modification areas, rugae support, direct – indirect retention.

Principles of removable partial Denture design – bio mechanic considerations, and the factors influence after mouth preparations – Occlusal relationship of remaining teeth, orientation of Occlusal plane, available space for restoration, arch integrity, tooth morphology, response of oral structure to previous stress, periodontal conditions, abutment support, tooth supported and tooth and tissue supported, need for indirect retention, clasp design, need for rebasing, secondary impression, need for abutment tooth modification, type of major connector, type of teeth selection, patients past experience, method of replacing single teeth or missing anterior teeth.

Difference between tooth supported and tissue supported partial dentures, essential of partial denture design, components of partial denture design, tooth support, ridge support, stabilizing components, guiding planes, use of splint bar for denture support, internal clip attachments, overlay abutment as support for a denture base, use of a component partial to gain support.
- c. Education of patient
- d. Diagnosis and treatment planning

- e. Design, treatment sequencing and mouth preparation
- f. Surveying - Description of dental surveyor, purposes of surveying, Aims and objectives in surveying of diagnostic cast and master cast, Final path of placement, factors that determine path of placement and removal, Recording relation of cast to surveyor, measuring retention, Blocking of master cast - paralleled blockout, shaped blockout, arbitrary blockout and relief.
- g. Diagnosis and treatment planning - Infection control and cross infection barriers - clinical and laboratory and hospital waste management, Objectives of prosthodontic treatment, Records, systemic evaluation, Oral examination, preparation of diagnostic cast, interpretation of examination data, radiographic interpretation, periodontal considerations, caries activity, prospective surgical preparation, endodontic treatment, analysis of occlusal factors, fixed restorations, orthodontic treatment, need for determining the design of components, impression procedures and occlusion, need for reshaping remaining teeth, reduction of unfavorable tooth contours, differential diagnosis : fixed or removable partial dentures, choice between complete denture and removable partial dentures, choice of materials
- h. Preparation of Mouth for removable partial dentures - Oral surgical preparation, conditioning of abused and irritated tissues, periodontal preparation - objectives of periodontal therapy, periodontal diagnosis, control therapy, periodontal surgery.
- i. Preparation of Abutment teeth - Classification of abutment teeth, sequence of abutment preparations on sound enamel or existing restorations, conservative restoration using crowns, splinting abutment teeth, utilization, temporary crowns to be used as abutment.
- j. Impression Materials and Procedures for Removable Partial Dentures - Rigid materials, thermoplastic materials, Elastic materials, Impressions of the partially edentulous arch, Tooth supported, tooth tissue supported, Individual impression trays.
- k. Support for the Distal Extension Denture Base - Distal extension removable partial denture, Factors influencing the support of distal extension base, Methods for obtaining functional support for the distal extension base.
- l. Laboratory Procedures - Duplicating a stone cast, Waxing the partial denture framework, Anatomic replica patterns, Spruing, investing, burnout, casting and finishing of the partial denture framework, making record bases, occlusion rims, making a stone occlusal template from a functional occlusal record, arranging posterior teeth to an opposing cast or template, types of anterior teeth, waxing and investing the partial denture before processing acrylic resin bases, processing the denture, remounting and occlusal correction to an occlusal template, polishing the denture.
- m. Initial placement, adjustment and servicing of the removable partial denture - adjustments to bearing surfaces of denture framework, adjustment of occlusion in harmony with natural and artificial dentition, instructions to the patient, follow - up services
- n. Relining and Rebasing the removable partial denture - Relining tooth supported dentures bases, relining distal extension denture bases, methods of reestablishing occlusion on a relined partial denture.
- o. Repairs and additions to removable partial dentures - Broken clasp arms, fractured occlusal rests, distortion or breakage of other components - major and minor connectors, loss of a tooth or teeth not involved in the support or retention of the restoration, loss of an abutment tooth necessitating its replacement and making a new direct retainer, Other types of repairs, Repair by soldering.
- p. Removable partial denture considerations in maxillofacial prosthetics - Maxillofacial prosthetics, intra oral prosthesis, design considerations, maxillary prosthesis, Obturators, speech aids, palatal lifts, palatal augmentations, mandibular prosthesis, treatment planning, framework design, class I resection, Class II resection, mandibular flange prosthesis, jaw relation record
- q. Management of failed restorations and work authorization.

#### **I. MAXILLOFACIAL REHABILITATION:**

cope, terminology, definitions, cross infection control and hospital waste management, work authorization.

behavioral and psychological issues in Head and neck cancer, Psychodynamic interactions - clinician and patient - Cancer Chemotherapy: Oral Manifestations, Complications, and management, Radiation therapy of head and neck tumors: Oral effects, Dental manifestations and

**dental treatment:** Etiology, treatment and rehabilitation (restoration) - Acquired defects of the mandible, acquired defects of hard palate, soft palate, clinical management of edentulous and partially edentulous maxillectomy patients, Facial defects, Restoration of speech, Velopharyngeal function, cleft lip and palate, cranial implants, maxillofacial trauma, Lip and cheek support prosthesis, Laryngectomy aids, Obstructive sleep apnoea, Tongue prosthesis, Esophageal prosthesis, Vaginal radiation carrier, Burn stents, Nasal stents, Auditory inserts, trismus appliances, mouth controlled devices for assisting the handicapped, custom prosthesis for lagophthalmos of the eye. Osseous integrated supported facial and maxillofacial prosthesis. Resin bonding for maxillofacial prosthesis, Implant rehabilitation of the mandible compromise by radiotherapy, Craniofacial Osseo integration, Prosthodontic treatment, Material and laboratory procedures for maxillofacial prosthesis.

### III. OCCLUSION

#### EVALUATION, DIAGNOSIS AND TREATMENT OF OCCLUSAL PROBLEMS:

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

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

### IV. FIXED PROSTHODONTICS

- Scope, definitions and terminology, classification and principles, design, mechanical and biological considerations of components - Retainers, connectors, pontics, work authorization.
- **Diagnosis and treatment planning** - patients history and interview, patients desires and expectations and needs, systemic and emotional health, clinical examinations - head and neck, oral - teeth, occlusal and periodontal, Preparation of diagnostic cast, radiographic interpretation, Aesthetics, endodontics considerations, abutment selection - bone support, root proximities and inclinations, selection of abutments, for cantilever, pier abutments, splinting, available tooth structures and crown morphology, TMJ and muscles mastication and comprehensive planning and prognosis.
  - **Management of Carious teeth** - caries in aged, caries control, removal carious, protection of pulp, reconstruction measure for compromising teeth - retentive pins, horizontal slots, retention grooves, prevention of caries, diet, prevention of root caries and vaccine for caries.
  - **Periodontal considerations** - attachment units, ligaments, gingivitis, periodontitis. Microbiological aspect of periodontal diseases, marginal lesion, occlusal trauma, periodontal pockets attached gingiva, interdental papilla, gingival embrasures, gingival/periodontal prosthesis, radiographic interpretations of Periodontia, intraoral, periodontal splinting - Fixed prosthodontics with periodontially compromised dentitions, placement of margin restorations.
  - **Biomechanical principle of tooth preparations** - individual tooth preparations - Complete metal Crowns - P.F.C., All porcelain - Cerestore crowns, dicor crowns, inceram etc. porcelain jacket crowns partial 3/4, frontional half, radicular 7/8, telescopic, pin-ledge, laminates, inlays, onlays and preparations for restoration of teeth-amalgam, glass-ionomer and composite resins, Resin Bond retainers, Gingival marginal preparations - Design, material

- selection, and biological and mechanical considerations - intracoronar retainer and precision attachments - custom made and ready made
- **Isolation and fluid control** - Rubber dam applications, tissue dilation - soft tissue management for cast restoration, impression materials and techniques, provisional restoration, interocclusal records, laboratory support for fixed Prosthodontics, Occlusion, Occlusal equilibration, articulators, recording and transferring of occlusal relations, cementing of restorations.
  - **Resins, Gold and gold alloys, glass ionomer, restorations.**
  - **Restorations of endodontically treated teeth, Stomatognathic Dysfunction and management**
  - **Management of failed restorations**

**Osseo integrated supported fixed Prosthodontics** - Osseo integrated supported and tooth supported fixed Prosthodontics

**V. TMJ - Temporomandibular joint dysfunction - Scope, definitions, and terminology**

Temporomandibular joint and its function, Orofacial pain, and pain from the temporomandibular joint region, temporomandibular joint dysfunction, temporomandibular joint sounds, temporomandibular joint disorders

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

- Etiology, diagnosis and cranio mandibular pain, differential diagnosis and management of orofacial pain - pain from teeth, pulp, dentin, muscle pain; TMJ pain - psychologic, physiologic - endogenous control, acupuncture analgesia, Placebo effects on analgesia, Trigeminal neuralgia, Temporal arteritis
- Occlusal splint therapy - construction and fitting of occlusal splints, management of occlusal splints, therapeutic effects of occlusal splints, occlusal splints and general muscles performance, TMJ joint unloading and anterior repositioning appliances, use and care of occlusal splints.
- Occlusal adjustment procedures - Reversible - occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy - occlusal repositioning appliances, orthodontic treatment, Orthognathic surgery, fixed and removable prosthodontic treatment and occlusal adjustment, removable prosthodontic treatment and occlusal adjustment, Indication for occlusal adjustment, special nature of orofacial pain, Indication for occlusal adjustment, special nature of orofacial pain, Psychopathological considerations, occlusal adjustment philosophies, mandibular position, excursive guidance,, occlusal contact scheme, goals of occlusal adjustment, significance of a slide in centric, Preclinical procedures, clinical procedures for occlusal adjustment.

**VI. AESTHETIC**

**SCOPE, DEFINITIONS :**

Morpho psychology and esthetics, structural esthetic rules - facial components, dental components, gingival components and physical components. Esthetics and its relationship to function - Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects, Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises Smile - classification and smile components, smile design, esthetic restoration of smile, Esthetic management of the dentogingival unit, intraoral materials for management of gingival contours, and ridge contours, Periodontal esthetics, Restorations - Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit, anatomy, inclinations, form, size, shape, color, embrasures, contact point.

**TEACHING AND LEARNING ACTIVITIES:**

All the candidates registered for MDS course shall pursue the course for a period of three years as full - time students. During this period each student shall take part actively in learning and teaching activities designed by the Institution/ University. The following teaching and learning activities in each speciality.



Prosthodontic treatment should be practiced by developing skills by teaching various and more number of patients to establish skill for diagnose and treatment and after care with bio-mechanical, biological, bio-esthetics, Bio-phonetics and all treatment should be carried out in more number for developing clinical skill

1. **Lectures:** There shall be didactic lectures both in the speciality and in the allied fields. The postgraduate departments should encourage the guest lectures in the required areas to strengthen the training programmes. It is also desirable to have certain integrated lectures by multidisciplinary teams on selected topics
2. **Journal club:** The journal review meetings shall be held at least once a week. All trainees are expected to participate actively and enter relevant details in logbook. Each trainee should make presentations from the allotted journal of selected articles at least 5 times in a year.
3. **Seminars:** The seminars shall be held at least twice a week in the department, all trainees associated with postgraduate teaching are expected to participate actively and enter relevant details in logbook. Each trainee shall make at least 5-seminar presentation in each year.
4. **Symposium:** It is recommended to hold symposium on topics covering multiple disciplines one in each academic year.
5. **Workshops:** It is recommended to hold workshops on topics covering multiple disciplines one in each academic year.
6. **Clinical Postings:** Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist
7. **Clinico Pathological Conference:** The Clinico pathological conferences should be held once in a month involving the faculties of oral biology, oral medicine and radiology, oral pathology, oral surgery, period-ontology, endodontia and concerned clinical department. The trainees should be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.
8. **Interdepartmental Meetings:** To bring in more integration among various specialities there shall be interdepartmental meeting chaired by the dean with all heads of postgraduate departments atleast once a month.
9. **Rural oriented prosthodontics health care -** To carry out a prosthodontic therapy interacting with rural centers and the institution.
10. **Teaching skills:** All the trainees shall be encouraged to take part in undergraduate teaching programmes either in the form of lectures or group discussions
11. **Evaluation skills:** All the trainees shall be encouraged to enhance their skills and knowledge in clinical, laboratory practice including theory by formulating question banks and model answers.
12. **Continuing dental Education programmes:** Each Postgraduate department shall organize these programmes on regular basis involving the other institutions. The trainees shall also be encouraged to attend such programmes conducted elsewhere.
13. **Conferences/Workshops/Advanced courses:** The trainees shall be encouraged not only to attend conference/workshops/advance courses but also to present atleast two papers at state/national speciality meeting during their training period.
14. **Rotational posting in other Departments:** To bring in more integration between the speciality and allied fields each post graduate department shall workout a programme to rotate the trainees in related disciplines and craniofacial and maxillofacial ward.
15. **Dissertation:** Trainees shall prepare a dissertation based on the clinical or laboratory experimental work or any other study conducted by them under the supervision of the post graduate guide.

#### **1 YEAR M.D.S.**

- Theoretical exposure of all applied sciences of study
- Clinical and non-clinical exercises involved in Prosthodontics therapy for assessment and acquiring higher competence
- Commencement of Library Assignment within six months.
- Short epidemiological study relevant to Prosthodontics.
- Acquaintance with books, journals and referrals to acquire knowledge of published books, journals and website for the purpose of gaining knowledge and reference - in the fields of Prosthodontics including Crown & bridge and implantology
- Acquire knowledge of instruments, equipment, and research tools in Prosthodontics.

- To acquire knowledge of Dental Material Science – Biological and biomechanical & bio-esthetics, knowledge of using material in laboratory and clinics including testing methods for dental materials.
- Participation and presentation in seminars, didactic lectures
- Evaluation – Internal Assessment examinations on Applied subjects

**II YEAR M.D.S.**

- Acquiring confidence in obtaining various phases and techniques for providing Prosthodontic therapy.
- Acquiring confidence by clinical practice with sufficient numbers of patients requiring tooth and tooth surface restorations.
- Fabrication of Adequate number of complete denture prosthesis following, higher clinical approach by utilizing semi-adjustable articulators, face bow and graphic tracing.
- Understanding the use of the dental surveyor and its application in diagnosis and treatment plan in R.P.D.
- Adequate numbers of R.P.D. covering all partially edentulous situation
- Adequate number of Crowns, Inlays, laminates F.P.D. covering all clinical situation.
- Selection of cases and principles in treatment of partially or complete edentulous patients by implant supported prosthesis.
- Treating single edentulous arch situation by implant supported prosthesis.
- Diagnosis and treatment planning for implant prosthesis.
- 1st stage and 2nd stage implant surgery
- Understanding the maxillofacial Prosthodontics.
- Treating craniofacial defects
- Management of orofacial defects
- Prosthetic management of TMJ syndrome
- Occlusal rehabilitation
- Management of failed restoration
- Prosthodontics Management of patient with psychogenic disorder.
- Practice of child and geriatric prosthodontics
- Participation and presentation in seminars, didactics lectures
- Evaluation – Internal Assessment examinations

**III YEAR M.D.S**

- Clinical and laboratory practice continued from 2nd year
- Occlusion equilibration procedures – fabrication of stabilizing splint for parafunctional disorders, occlusal disorders and TMJ functions.
- Practice of dental, oral and facial esthetics
- The clinical practice of all aspects of Prosthodontic therapy for elderly patients.
- Implants Prosthodontics – Rehabilitation of Partial Edentulous, Complete edentulism and for craniofacial rehabilitation
- Failures in all aspects of Prosthodontics and its management and after care
- Team management for esthetics, TMJ syndrome and Maxillofacial and Craniofacial Prosthodontics
- Management of Prosthodontics emergencies, resuscitation.
- Candidate should complete the course by attending by large number and variety of patients to master the prosthodontic therapy. This includes the practice management, examinations, treatment planning, communication with patients, clinical and laboratory techniques materials and instrumentation requiring different aspects of prosthodontic therapy, Tooth and Tooth surface restoration, Restoration of root treated teeth, splints for periodontal rehabilitations and fractured jaws, complete dentures, R.P.D. FPD. Immediate dentures over dentures implant supported prosthesis, maxillofacial and body prosthesis, occlusal rehabilitation.
- Prosthetic management of TMJ syndrome
- Management of failed restorations
- Complete and submit Library Assignment 6 months prior to examination.
- Candidates should acquire complete theoretical and clinical knowledge through seminars, symposium, workshops and reading.
- Participation and presentation in seminars, didactic lectures

- Evaluation - Internal Assessment examinations three months before University examinations

### PROSTHODONTIC TREATMENT MODALITIES

1. Diagnosis and treatment plan in prosthodontics
2. Tooth and tooth surface restorations

- Fillings
- Veneers - composites and ceramics
- Inlays - composite, ceramic and alloys
- Onlay - composite, ceramic and alloys
- Partial crowns -  $\frac{3}{4}$ <sup>th</sup>,  $\frac{4}{5}$ <sup>th</sup>,  $\frac{7}{8}$ <sup>th</sup>,  $\frac{1}{2}$  crowns
- Pin-ledge.
- Radicular crowns
- Full crowns

### 3. Tooth replacements

	<b>PARTIAL</b>	<b>COMPLETE</b>
• Tooth supported	Fixed partial denture	Overdenture
• Tissue supported	Interim partial denture Intermediate partial denture	Complete denture Immediate denture Immediate complete denture
• Tooth and tissue Supported	Cast partial denture Precision attachment	Overdenture
• Implant supported	Cement retained Screw retained Clip attachment	Bar attachment Ball attachment
• Tooth and implant Supported	Screw retained Cement retained	
• Root supported	Dowel and core Pin retained	Overdenture
➤ Precision attachments		
• Intra coronal attachments		
• Extra coronal attachments		
• Bar - slide attachments		
• Joints and hinge joint attachments		

### 4. Tooth and tissue defects (Maxillo- facial and Cranio-facial prosthesis)

#### A. Congenital Defects

- a. Cleft lip and palate
- b. Pierre Robin Syndrome
- c. Ectodermal dysplasia
- d. Hemifacial microsomia
- e. Anodontia
- f. Oligodontia
- g. Malformed teeth

cast partial dentures  
implant supported prosthesis  
complete dentures  
fixed partial dentures

#### B. Acquired defects

- a. Head and neck cancer patients - prosthodontic splints and stents
- b. Restoration of facial defects
  - Auricular prosthesis
  - Nasal prosthesis
  - Orbital prosthesis
  - Craniofacial implants
- c. Midfacial defects
- d. Restoration of maxillofacial trauma
- e. Hemimandibular defects
- f. Maxillofacial
- g. Lip and cheek support prosthesis
- h. Ocular prosthesis
- i. Speech and Velopharyngeal prosthesis

cast partial denture  
implant supported dentures  
complete dentures

- j. Laryngectomy aids
  - k. Esophageal prosthesis
  - l. Nasal stents
  - m. Tongue prosthesis
  - n. Burn stents
  - o. Auditory inserts
  - p. Trismus appliances
- 5. T.M.J and Occlusal disturbances**
- a. Occlusal equilibration
  - b. Splints - Diagnostic  
- Repositioners / Deprogrammers
  - c. Anterior bite plate
  - d. Posterior bite plate
  - e. Bite raising appliances
  - f. Occlusal rehabilitation
- 6. Esthetic/Smile designing**
- a. Laminates / Veneers
  - b. Tooth contouring (peg laterals, malformed teeth)
  - c. Tooth replacements
  - d. Team management
- 7. Psychological therapy**
- a. Questionnaires
  - b. Charts, papers, photographs
  - c. Models
  - d. Case reports
  - e. Patient counseling
  - f. Behavioral modifications
  - g. Referrals
- 8. Geriatric Prosthodontics**
- a. Prosthodontics for the elderly
  - b. Behavioral and psychological counseling
  - c. Removable Prosthodontics
  - d. Fixed Prosthodontics
  - e. Implant supported Prosthodontics
  - f. Maxillofacial Prosthodontics
  - g. Psychological and physiological considerations
- 9. Preventive measures**
- a. Diet and nutrition modulation and counseling
  - b. Referrals
- The bench work should be completed before the clinical work starts during the first year of the MDS Course**
- I. Complete dentures**
1. Arrangements in adjustable articulator for
    - Class I
    - Class II
    - Class III
  2. Various face bow transfer to adjustable articulators
  3. Processing of characterized anatomical denture
- II. Removable partial denture**
1. Design for Kennedy's Classification  
(Survey, block out and design)
    - a. Class I
    - b. Class II
    - c. Class III
    - d. Class IV

2. Designing of various components of RPD
3. Wax pattern on refractory cast
  - a. Class I
  - b. Class II
  - c. Class III
  - d. Class IV
4. Casting and finishing of metal frameworks
5. Acrylisation on metal frameworks for
  - Class I
  - Class III with modification

**Fixed Partial Denture**

1. Preparation in ivory teeth / natural teeth
  - FVC for metal
  - FVC for ceramic
  - Porcelain jacket crown
  - Acrylic jacket crown
  - PFM crown
  - 3/4<sup>th</sup> (canine, premolar and central)
  - 7/8<sup>th</sup> posterior
  - Proximal half crown
  - Inlay – Class I, II, V
  - Onlay – Pin ledged, pinhole
  - Laminates
2. Preparation of different die system
3. Fabrication of wax pattern by drop wax build up technique
  - Wax in increments to produce wax coping over dies of tooth preparations on substructures
  - Wax additive technique
  - 3-unit wax pattern (maxillary and Mandibular)
  - Full mouth
4. Pontic design in wax pattern
  - Ridge lap
  - Sanitary
  - Modified ridge lap
  - Modified sanitary
  - Spheroidal or conical
5. Fabrication of metal framework
  - Full metal bridge for posterior (3 units)
  - Coping for anterior (3 unit)
  - Full metal with acrylic facing
  - Full metal with ceramic facing
  - Adhesive bridge for anterior
  - Coping for metal margin ceramic crown
  - Pin ledge crown
6. Fabrication of crowns
  - All ceramic crowns with characterisation
  - Metal ceramic crowns with characterisation
  - Full metal crown
  - Precious metal crown
  - Post and core
7. Laminates
  - Composites with characterisation
  - Ceramic with characterisation
  - Acrylic
8. Preparation for composites
  - Laminates
  - Crown

- Inlay
- Onlay
- Class I
- Class II
- Class III
- Class IV
- Fractured anterior tooth

**IV. Maxillofacial prosthesis**

1. Eye
2. Ear
3. Nose
4. Face
5. Body
6. Cranial
7. Maxillectomy
8. Hemimandibulectomy
9. Finger prosthesis
10. Guiding flange
11. Obturator

**V. Implant supported prosthesis**

1. Step by step procedures - laboratory phase

**VI. Other exercises**

1. TMJ splints - stabilization appliances, maxillary and Mandibular repositioning appliances
2. Anterior disclusion appliances
3. Chrome cobalt and acrylic resin stabilization appliances
4. Modification in accommodation in irregularities in dentures
5. Occlusal splint
6. Periodontal splint
7. Precision attachments - custom made
8. Over denture coping
9. Full mouth rehabilitation (by drop wax technique, ceramic build up)
10. TMJ appliances - stabilization appliances

**ESSENTIAL SKILLS:**

\*Key

O - Washes up and observes

A - Assists a senior

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

PI - Performs independently

PROCEDURE	CATEGORY			
	O	A	PA	PI
Tooth and tooth surface restoration				
a) Composites - fillings, laminates, inlay, onlay	2	2	2	10
b) Ceramics - laminates, inlays, onlays	2	2	2	10
c) Glass ionomer	1	1	1	10
<b>CROWNS</b>				
FVC for metal	1	2	2	10
FVC for ceramic	1	2	2	10
Precious metal crown	1	-	1	5
Galvanoformed crown	-	-	1	1
3/4 <sup>th</sup> crowns (premolars, canines and centrals)	1	-	-	5
7/8 <sup>th</sup> posterior crown	1	-	-	5
Proximal half crown	1	-	-	5
Pinledge and pinhole crowns	1	-	-	5
Telescopic crowns	1	-	-	5
Intraradicular crowns (central, lateral, canine, premolar, and molar)	1	-	-	5

Crown as implant supported prosthesis	1	-	1	5
<b>FIXED PARTIAL DENTURES</b>				
Cast porcelain (3 unit)	1	-	-	5
Cast metal - precious and non precious (3 unit posterior)	1	-	-	5
Porcelain fused metal (anterior and posterior)	1	1	1	10
Multiple abutment - maxillary and Mandibular full arch	1	1	1	5
Incorporation of custom made and ready made precision joint or attachments	1	1	1	4
Adhesive bridge for anterior/posterior	1	-	1	10
Metal fused to resin anterior FPD	-	-	1	5
Interim provisional restorations (crowns and FPDs)	1	1	1	10
Immediate fixed partial dentures (interim)	1	-	-	5
Fixed prosthesis as a retention and rehabilitation for acquired and congenital defects - maxillofacial prosthetics	1	1	1	5
Implant supported prosthesis	1	-	1	1
Implant - tooth supported prosthesis	1	-	1	1
<b>REMOVABLE PARTIAL DENTURE</b>				
Provisional partial denture prosthesis	1	1	1	10
Cast removable partial denture (for Kennedy's Applegate classification with modification)	1	1	1	6
Removable bridge with precision attachments and telescopic crowns for anterior and posterior	1	1	2	4
Immediate RPD	1	1	1	5
Partial denture for medically compromised and handicapped patients	1	1	1	5
<b>COMPLETE DENTURES</b>				
Neurocentric occlusion & characterized prosthesis	-	-	1	5
Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-	1	25
Single dentures	-	-	1	5
Overlay dentures	-	-	1	5
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-	1	5
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-	1	5
Complete dentures for patients with TMJ syndromes	-	-	1	5
Complete dentures for medically compromised and handicapped patients	-	-	1	5
<b>GERIATRIC PATIENTS</b>				
Tooth and tooth surface restorations, crowns, fixed prosthesis, removable prosthesis	-	-	1	5
<b>IMPLANT SUPPORTED COMPLETE PROSTHESIS</b>				
Implant supported complete prosthesis (maxillary and Mandibular)	-	-	1	1
<b>MAXILLOFACIAL PROSTHESIS</b>				
Guiding flange and obturators	-	-	1	4
Speech and palatal lift prosthesis	-	-	1	2
Eye prosthesis	-	-	1	2
Ear prosthesis	-	-	1	2
Nose prosthesis	-	-	1	2
Face prosthesis	-	-	-	1
Maxillectomy	-	-	1	2
Hemimandibulectomy	-	-	1	2
Cranioplasty	-	-	1	1

Finger/ hand, foot	-	-	1	2
Body prosthesis	-	-	1	1
Management of burns, scars	-	-	-	1
<b>TMJ SYNDROME MANAGEMENT</b>				
Splints - periodontal, teeth, jaws	-	-	1	4
TMJ supportive and treatment prosthesis	-	-	1	1
Stabilization appliances for maxilla and mandible with freedom to move from IP to CRCP	-	-	-	1
In IP without the freedom to move to CRCP	-	-	-	1
Repositioning appliances, anterior disclusion	-	-	-	1
Chrome cobalt and acrylic resin stabilization appliances for modification to accommodate for the irregularities in the dentition	-	-	-	2
Occlusal adjustment and occlusal equilibrium	-	-	1	4
<b>FULL MOUTH REHABILITATION</b>				
Full mouth rehabilitation - restoration of esthetics and function of stomatognathic system	-	-	1	4
<b>INTER-DISCIPLINARY TREATMENT MODALITIES</b>				
Inter-disciplinary management - restoration of Oro craniofacial defects for esthetics, phonation, mastication and psychological comforts	-	-	1	2
<b>MANAGEMENT OF FAILED RESTORATION</b>				
Tooth and tooth surface restorations	-	-	-	5
Removable prosthesis	-	-	-	10
Crowns and fixed prosthesis	-	-	-	5
Maxillofacial prosthesis	-	-	-	2
Implant supported prosthesis	-	-	-	1
Occlusal rehabilitation and TMJ syndrome	-	-	-	2
Restoration failure of psychogenic origin	-	-	-	5
Restoration failure to age changes	-	-	-	2

**SCHEME OF EXAMINATION:****A. Theory : 300 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

Paper I : Applied Basic Sciences: Applied Anatomy, embryology, growth and development Genetics, Immunology, anthropology, Physiology, nutrition & Biochemistry, Pathology & Microbiology, virology, Applied pharmacology, Research Methodology and bio statistics, Applied Dental anatomy & histology, Oral pathology & oral Microbiology, Adult and geriatric psychology. Applied dental materials.

Paper II : Removable Prosthodontics and Implant supported prosthesis(Implantology), Geriatric dentistry and Cranio facial Prosthodontics

Paper III : Fixed Prosthodontics, occlusion, TMJ and esthetics.

Paper IV : Essay

\*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical / Clinical Examination : 200 Marks**

Examination shall be for three days. If there are more than 6 candidates, it may be extended for one more day. Each candidate shall be examined for a minimum of three days, six hours per day including viva voce.



**1. Presentation of treated patients and records during their 3 years training period - 25 Marks**

- |  |           |
|--|-----------|
| a. C.D.  | - 1 mark  |
| b. R. P.D.   | - 2 marks |
| c. F.P.D. including single tooth and surface restoration | - 2 marks |
| d. I.S.P.  | - 5 marks |
| e. Occlusal rehabilitation                               | - 5 marks |
| f. T.M.J.  | - 5 marks |
| g. Maxillofacial Prosthesis                              | - 5 marks |

**2. Present actual treated patients C.D. Prosthesis and Insertion - 90 Marks**

- |  |            |
|--|------------|
| 1. Discussion on treatment plan and patient review   | - 10 marks |
| 2. Tentative jaw relation records  | - 5 marks  |
| 3. Face Bow - transfer   | - 5 marks  |
| 4. Transferring it on articulators   | - 5 marks  |
| 5. Extra oral tracing and securing centric and protrusive/lateral, record                                      | - 25 marks |
| 6. Transfer in on articulator.   | - 5 marks  |
| 7. Selection of teeth  | - 5 marks  |
| 8. Arrangement of teeth  | - 15 marks |
| 9. Waxedup denture trial   | - 10 marks |
| 10. Fit, insertion and instruction of previously processed characterised, anatomic complete denture prosthesis | - 5 marks  |

All steps will include chairside, lab and viva voce

**3. Fixed Partial Denture - 50 Marks**

- |   |            |
|---|------------|
| a. Case discussion and selection of patients for F.P.D. | - 5 marks  |
| b. Abutment preparation isolation and fluid control     | - 25 marks |
| c. Gingival retraction and impressions                  | - 10 marks |
| d. Cementation of provisional restoration               | - 10 marks |

**4. Removable Partial Denture - 35 Marks**

- |   |            |
|---|------------|
| a. Surveying and designing of partial dentate cast.                           | - 10 marks |
| b. Discussion on components and material selection including occlusal scheme. | - 15 marks |

**C. Viva Voce : 100 Marks**

*i. Viva-Voce examination: 80 marks*

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

*ii. Pedagogy Exercise: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**2. PERIODONTOLOGY**

**OBJECTIVES:**

The following objectives are laid out to achieve the goals of the course

**KNOWLEDGE:**

Discuss historical perspective to advancement in the subject proper and related topics.

- Describe etiology, pathogenesis, diagnosis and management of common periodontal diseases with emphasis on Indian population
- Familiarize with the biochemical, microbiologic and immunologic genetic aspects of periodontal pathology

- Describe various preventive periodontal measures
- Describe various treatment modalities of periodontal disease from historical aspect to currently available ones
- Describe interrelationship between periodontal disease and various systemic conditions
- Describe periodontal hazards due to estrogenic causes and deleterious habits and prevention of it
- Identify rarities in periodontal disease and environmental/Emotional determinates in a given case
- Recognize conditions that may be outside the area of his Speciality/ competence and refer them to an appropriate Specialist
- Decide regarding non-surgical or surgical management of the case
- Update him by attending course, conferences and seminars relevant to periodontics or by self-learning process.
- Plan out/ carry out research activity both basic and clinical aspects with the aim of publishing his work in scientific journals
- Reach to the public to motivate and educate regarding periodontal disease, its prevention and consequences if not treated
- Plan out epidemiological survey to assess prevalence and incidence of early onset periodontitis and adult periodontitis in Indian population (Region wise)
- Shall develop knowledge, skill in the science and practice of Oral Implantology
- Shall develop teaching skill in the field of Periodontology and Oral Implantology

**ILLS:**

- Take a proper clinical history, thorough examination of intra orally, extra orally, medical history evaluation, advice essential diagnostic procedures and interpret them to come to a reasonable diagnosis
- Effective motivation and education regarding periodontal disease maintenance after the treatment
- Perform both non-surgical & education regarding periodontal disease, maintenance after the treatment
- Perform both non-surgical and surgical procedures independently
- Provide Basic Life Support Service (BLS) recognizes the need for and advance life support and does the immediate need for that.
- Human values, ethical practice to communication abilities
- Adopt ethical principles in all aspects of treatment modalities, Professional honesty & integrity are to be fostered Develop, Adopt ethical principles in all aspects of treatment modalities; Professional honesty & integrity are to be fostered. Develop Communication skills to make awareness regarding periodontal disease Apply high moral and ethical standards while carrying out human or animal research, Be humble, accept the limitations in his knowledge and skill, and ask for help from colleagues when needed, Respect patients rights and privileges, including patients right to information and right to seek a second opinion.

**COURSE CONTENTS:****APER-I****APPLIED ANATOMY:**

1. Development of the Periodontium
2. Micro and Macro structural anatomy and biology of the periodontal tissues
3. Age changes in the periodontal tissues
4. Anatomy of the Periodontium
  - Macroscopic and microscopic anatomy
  - Blood supply of the Periodontium
  - Lymphatic system of the Periodontium
  - Nerves of the Periodontium
5. Temporomandibular joint, Maxillae and Mandible
6. Nerves of Periodontics
7. Tongue, oropharynx
8. Muscles of mastication

**PHYSIOLOGY:**

1. Blood
2. Respiratory system - Acknowledge of the respiratory diseases which are a cause of periodontal diseases (periodontal Medicine)
3. Cardiovascular system
  - a. Blood pressure
  - b. Normal ECG
  - c. Shock
4. Endocrinology - hormonal influences on Periodontium
5. Gastrointestinal system
  - a. Salivary secretion - composition, function & regulation
  - b. Reproductive physiology
  - c. Hormones - Actions and regulations, role in periodontal disease
  - d. Family planning methods
6. Nervous system
  - a. Pain pathways
  - b. Taste - Taste buds, primary taste sensation & pathways for sensation

**BIOCHEMISTRY:**

1. Basics of carbohydrates, lipids, proteins, vitamins, proteins, enzymes and minerals
2. Diet and nutrition and periodontium
3. Biochemical tests and their significance
4. Calcium and phosphorus

**PATHOLOGY:**

1. Cell structure and metabolism
2. Inflammation and repair, necrosis and degeneration
3. Immunity and hypersensitivity
4. Circulatory disturbances - edema, hemorrhage, shock, thrombosis, embolism, infarction and hypertension
5. Disturbances of nutrition
6. Diabetes mellitus
7. Cellular growth and differentiation, regulation
8. Lab investigations
9. Blood

**MICROBIOLOGY:**

1. General bacteriology
  - a. Identification of bacteria
  - b. Culture media and methods
  - c. Sterilization and disinfection
2. Immunology and Infection
3. Systemic bacteriology with special emphasis on oral microbiology - staphylococci, genus actinomyces and other filamentous bacteria and actinobacillus actinomycetumcomitans
4. Virology
  - a. General properties of viruses
  - b. Herpes, Hepatitis, AIDS, HIV virus
5. Mycology
  - a. Classification
6. Applied microbiology
7. Diagnostic microbiology and immunology, hospital infections and management

**PHARMACOLOGY:**

1. General pharmacology
  - a. Fundamentals - Pharmacokinetics with clinical applications, routes of administration including local drug delivery in Periodontics
  - b. Adverse drug reactions and drug interactions
2. Detailed pharmacology of
  - a. Analgesics - opioid and nonopioid

- b. Local anesthetics
- c. Haematinics and coagulants, Anticoagulants
- d. Vit D and Calcium preparations
- e. Antidiabetic drugs
- f. Steroids
- g. Antibiotics
- h. Antihypertensive
- i. Immunosuppressive drugs and their effects on oral tissues
- j. Antiepileptic drugs
3. Brief pharmacology, dental use and adverse effects of
  - a. General anesthetics
  - b. Antipsychotics
  - c. Antidepressants
  - d. Anxiolytic drugs
  - e. Sedatives
  - f. Antiepileptics
  - g. Antihypertensives
  - h. Antianginal drugs
  - i. Diuretics
  - j. Hormones
  - k. Pre-anesthetic medications
4. Drugs used in Bronchial asthma cough
5. Drug therapy of
  - a. Emergencies
  - b. Seizures
  - c. Anaphylaxis
  - d. Bleeding
  - e. Shock
  - f. Diabetic ketoacidosis
  - g. Acute Addisonian crisis
6. Dental Pharmacology
  - a. Antiseptics
  - b. Astringents
  - c. Sialogogues
  - d. Disclosing agents
  - e. Antiplaque agents
7. Fluoride pharmacology

**BIOSTATISTICS:**

- Introduction, definition and branches of biostatistics
- Collection of data, sampling, types, bias and errors
- Compiling data-graphs and charts
- Measures of central tendency (mean, median and mode), standard deviation and variability
- Tests of significance (chi square test, t-test and Z-test)
- Null hypothesis

**PAPER-II****ETIOPATHOGENESIS:**

1. Classification of periodontal diseases and conditions
2. Epidemiology of gingival and periodontal diseases
3. Defense mechanisms of gingiva
4. Periodontal microbiology
5. Basic concepts of inflammation and immunity
6. Microbial interactions with the host in periodontal diseases
7. Pathogenesis of plaque associated periodontal diseases
8. Dental calculus
9. Role of iatrogenic and other local factors
10. Genetic factors associated with periodontal diseases
11. Influence of systemic diseases and disorders of the periodontium

12. Role of environmental factors in the etiology of periodontal disease
13. Stress and periodontal diseases
14. Occlusion and periodontal diseases
15. Smoking and tobacco in the etiology of periodontal diseases
16. AIDS and periodontium
17. Periodontal medicine
18. Dentinal hypersensitivity

#### **PAPER-III**

#### **Clinical and Therapeutic Periodontology and Oral Implantology**

##### **Please note:**

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

#### **I. GINGIVAL DISEASES**

1. Gingival inflammation
2. Clinical features of gingivitis
3. Gingival enlargement
4. Acute gingival infections
5. Desquamative gingivitis and oral mucous membrane diseases
6. Gingival diseases in the childhood

#### **II. PERIODONTAL DISEASES**

1. Periodontal pocket
2. Bone loss and patterns of bone destruction
3. Periodontal response to external forces
4. Masticatory system disorders
5. Chronic periodontitis
6. Aggressive periodontitis
7. Necrotising ulcerative periodontitis
8. Interdisciplinary approaches
  - Orthodontic
  - Endodontic
9. Periodontic considerations in periodontal therapy

#### **III. TREATMENT OF PERIODONTAL DISEASES**

##### **A. History, examination, diagnosis, prognosis and treatment planning**

1. Clinical diagnosis
2. Radiographic and other aids in the diagnosis of periodontal diseases
3. Advanced diagnostic techniques
4. Risk assessment
5. Determination of prognosis
6. Treatment plan
7. Rationale for periodontal treatment
8. General principles of anti-infective therapy with special emphasis on infection control in periodontal practice
9. Halitosis and its treatment
10. Bruxism and its treatment

##### **B. Periodontal instrumentation**

1. Instrumentation
2. Principles of periodontal instrumentation
3. Instruments used in different parts of the mouth

##### **C. Periodontal therapy**

1. Preparation of tooth surface
2. Plaque control
3. Anti microbial and other drugs used in periodontal therapy and wasting diseases of teeth
4. Periodontal management of HIV infected patients
5. Occlusal evaluation and therapy in the management of periodontal diseases
6. Role of orthodontics as an adjunct to periodontal therapy

- 7. Special emphasis on precautions and treatment for medically compromised patients
- 8. Periodontal splints
- 9. Management of dentinal hypersensitivity

- D. Periodontal surgical phase – special emphasis on drug prescription**
- 1. General principles of periodontal surgery
  - 2. Surgical anatomy of periodontium and related structures
  - 3. Gingival curettage
  - 4. Gingivectomy technique
  - 5. Treatment of gingival enlargements
  - 6. Periodontal flap
  - 7. Osseous surgery (resective and regenerative)
  - 8. Furcation; Problem and its management
  - 9. The periodontic – endodontic continuum
  - 10. Periodontic plastic and esthetic surgery
  - 11. Recent advances in surgical techniques

- E. Future directions and controversial questions in periodontal therapy**
- 1. Future directions for infection control
  - 2. Research directions in regenerative therapy
  - 3. Future directions in anti-inflammatory therapy
  - 4. Future directions in measurement of periodontal diseases

- F. Periodontal maintenance phase**
- 1. Supportive periodontal treatment
  - 2. Results of periodontal treatment

**IV. ORAL IMPLANTOLOGY**

- 1. Introduction and historical review
- 2. Biological, clinical and surgical aspects of dental implants
- 3. Diagnosis and treatment planning
- 4. Implant surgery
- 5. Prosthetic aspects of dental implants
- 6. Diagnosis and treatment of Peri implant complications
- 7. Special emphasis on plaque control measures implant patients
- 8. Maintenance phase

**V. MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE**

**Teaching / learning Activities**

- **Seminars:** - A minimum of 15 seminars to be presented by each student during the P.G. course (Atleast 5 Seminars per year)
- **Journal clubs:** - a minimum of 25 Journal articles to be reviewed by each student during the P.G. course
- **Interdepartmental Seminars:** - Each P.G. student should present at least 1 seminar in an interdepartmental meeting during the P.G. course. Such meetings may be held at least once every month
- **Library Assignment:** - one to be presented at the end of 18 months of the course

**ACADEMIC ACTIVITIES:**

**I Year**

Submission of synopsis for Dissertation – within 6 months from the start of the course  
Library Assignment – to be submitted at the end of the 1 year

**II Year**

Scientific Paper presentation at the conferences

**III Year**

Scientific Paper/ Poster presentation at conferences  
Submission of Dissertation – 6 months before completion of III year

**SKILLS:**

**First year**

Pre – Clinical work

**Dental**

1. Practice of incisions and suturing techniques on the typhodont models
2. Fabrication of bite guards and splints
3. Occlusal adjustments on the casts mounted on the articulator
4. X-Ray techniques and interpretation
5. Local anesthetic techniques

**Medical**

1. Basic diagnostic microbiology and immunology, collection and handling of sample, culture techniques
2. Basic understanding of immunological diseases
3. Interpretation of various biochemical investigations
4. Practical training and handling medical emergencies and basic life support devices
5. Basic Biostatistics – Surveying and data analysis

**Clinical work**

- |                                    |          |
|------------------------------------|----------|
| 1. Applied periodontal indices     | 10 CASES |
| 2. Scaling and root planning (SRP) |          |
| a. Hand                            | 15 CASES |
| b. Ultrasonic                      | 15 CASES |
| 3. Curettage                       | 10 CASES |
| 4. Gingivectomy                    | 20 CASES |
| 5. Gingivoplasty                   | 10 CASES |

**Second Year**

- |  |          |
|--|----------|
| 1. Clinical Work                       | 10 CASES |
| 2. Case history and treatment planning | 5 CASES  |
| 3. Local Drug Delivery techniques      |          |
| 4. Periodontal surgical procedures     |          |
| - Pocket therapy                       |          |
| - Muco-gingival surgeries              |          |
| - Implants (2 implants)                |          |
| - Management of perio endo problems    |          |
| 5. Occlusal adjustments                | 10 CASES |
| 6. Perio splints                       | 10 CASES |

**Third Year****Clinical work**

1. Regenerative techniques
  - Using various graft and barrier membranes
2. Record, maintenance and follow up of all treated cases including implants

**Assessment examinations:-** In addition to the regular evaluation, log book etc., Assessment examination should be conducted once every six months & progress of the student monitored

**Note:**

Submission of Synopsis for Dissertation should be done within 6 months of the commencement of the course

Submission of two copies of Library Assignments at the end of 1 and 2<sup>nd</sup> year

Submission of pre-clinical work as scheduled

Submission of Dissertation – 6 months before completion of III year

Maintenance of Work Diary/Log book as prescribed by RGUHS

**MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV

**SCHEME OF EXAMINATION:****A. Theory : 300 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

**Paper I :** Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

**Paper II:** Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics

**Paper III:** Periodontal diagnosis, therapy & Oral implantology

**Paper IV:** Essay (with emphasis on recent advances in periodontics)

\*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical / Clinical Examination : 200 Marks**

The clinical examination shall be of two days duration:

**1<sup>st</sup> day****Case discussion**

- Long case - One
- Short case - One

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

**2<sup>nd</sup> day**

Post-surgical review and discussion of the case treated on the 1<sup>st</sup> day

Presentation of dissertation & discussion

All the examiners shall participate in all the aspects of clinical examinations / Viva Voce

Distribution of Marks for Clinical examination (recommended)

a) Long Case discussion	50
b) 2 short cases	50
c) Periodontal surgery	75
Post - operative review	25
<b>Total</b>	<b>200</b>

**C. Viva Voce : 100 Marks****i. Viva-Voce examination: 80 marks**

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

**ii. Pedagogy : 20 marks**

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**3. ORAL AND MAXILLOFACIAL SURGERY****OBJECTIVES:**

The training program in Oral and Maxillofacial Surgery is structured to achieve the following four objectives-

- Knowledge
- Skills
- Attitude



- Communicative skills and ability
- Research

**KNOWLEDGE:**

- To have acquired adequate knowledge and understanding of the etiology, pathophysiology and diagnosis, treatment planning of various common oral and Maxillofacial surgical problems both minor and major in nature
- To have understood the general surgical principles like pre and post surgical management, particularly evaluation, post surgical care, fluid and electrolyte management, blood transfusion and post surgical pain management.
- Understanding of basic sciences relevant to practice of oral and maxillofacial surgery
- Able to identify social, cultural, economic, genetic and environmental factors and their relevance to disease process management in the oral and Maxillofacial region.
- Essential knowledge of personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste keeping in view the high prevalence of hepatitis and HIV.

**SKILLS:**

- To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures and order relevant laboratory tests and interpret them and to arrive at a reasonable diagnosis about the surgical condition.
- To perform with competence minor oral surgical procedures and common maxillofacial surgery. To treat both surgically and medically (or by other means of the oral and Maxillofacial and the related area).
- Capable of providing care for maxillofacial surgery patients.

**ATTITUDE:**

- Develop attitude to adopt ethical principles in all aspect of surgical practice, professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Willing to share the knowledge and clinical experience with professional colleagues.
- Willing to adopt new techniques of surgical management developed from time to time based on scientific research which are in the best interest of the patient
- Respect patient right and privileges, including patients right to information and right to seek a second opinion.
- Develop attitude to seek opinion from an allied medical and dental specialists as and when required.

**COMMUNICATION SKILLS:**

- Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular surgical problem and obtain a true informed consent from them for the most appropriate treatment available at that point of time
- Develop the ability to communicate with professional colleagues.
- Develop ability to teach undergraduates.

**COURSE CONTENT:**

The program outline addresses both the knowledge needed in Oral and Maxillofacial Surgery and allied medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified will equip the trainee with skill and knowledge at its completion to be able to practice basic oral and Maxillofacial surgery competently and have the ability to intelligently pursue further apprenticeship towards advanced Maxillofacial surgery.

The topics are considered as under:-

- Basic sciences
- Oral and Maxillofacial surgery
- Allied specialties

**APPLIED BASIC SCIENCES:**

A thorough knowledge both on theory and principles in general and particularly the basic medical subjects as relevant to the practice of maxillofacial surgery. It is desirable to have adequate knowledge in bio-statistics, Epidemiology, research methodology, nutrition and computers.

**ANATOMY:**

Development of face, paranasal sinuses and associated structures and their anomalies; surgical anatomy of scalp temple and face, anatomy and its applied aspects of triangles of neck, deep structures of neck, cranial and facial bones and its surrounding soft tissues, cranial nerves tongue temporal and infratemporal region, orbits and its contents, muscles of face and neck, paranasal sinuses, eyelids and nasal septum, teeth, gums and palate, salivary glands, pharynx, thyroid and parathyroid glands, larynx, trachea and esophagus, congenital abnormality of orofacial regions. General consideration of the structure and function of brain and applied anatomy of intracranial venous sinuses; cavernous sinus and superior sagittal sinus, Brief consideration of autonomous nervous system of head and neck, Functional anatomy of mastication, deglutition, speech respiration and circulation. Histology of skin, oral mucosa, connective tissue bone, cartilage cellular elements of blood vessels, lymphatic, nerves, muscles, tongue, tooth and its surrounding structures.

**PHYSIOLOGY:**

Nervous system-physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature; Blood-its composition hemostasis, blood dyscrasias and its management, hemorrhage and its control, blood grouping, cross matching, blood component therapy, complications of blood transfusion, blood substitutes, auto transfusion, cell savers; Digestive system composition and functions of saliva mastication deglutition, digestion, assimilation, urine formation, normal and abnormal constituents; Respiration control of ventilation anoxia, asphyxia, artificial respiration, hypoxia - types and management; CVS - cardiac cycle, shock, heart sounds, blood pressure, hypertension; Endocrinology-metabolism of calcium; endocrinal activity and disorder relating to thyroid gland, parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads; Nutrition-general principles balanced diet. Effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus, Nutritional assessment, metabolic responses to stress, need for nutritional support, enteral nutrition, routes of access to GI tract, Parenteral nutrition, Access to central veins, Nutritional support; Fluid and Electrolytic balance/Acid Base metabolism-body fluid compartment, metabolism of water and electrolytes, factors maintaining hemostasis, causes & treatment of acidosis and alkalosis.

**BIOCHEMISTRY:**

General principles governing the various biological principles of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc; general composition of body, intermediary metabolism, carbohydrate, proteins, lipids, enzymes, vitamins, minerals and antimetabolites

**GENERAL PATHOLOGY:**

Inflammation - Acute and chronic inflammation, repair and regeneration, necrosis and gangrene, role of component system in acute inflammation, role of arachidonic acid and its metabolites in acute inflammation, growth factors in acute inflammation role of NSAIDS in inflammation, cellular changes in radiation injury and its manifestation; Wound management - Wound healing factors influencing healing; properties of suture materials, appropriate uses of sutures; hemostasis - role of endothelium in thrombogenesis; arterial and venous thrombi, disseminated intravascular coagulation; Hypersensitivity; Shock and pulmonary failure: types of shock, diagnosis, resuscitation, pharmacological support, ARDS and its causes and prevention, ventilation and support, Neoplasm - classification of tumors, Carcinogens and Carcinogenesis, grading and staging of tumors, various laboratory investigation.

**GENERAL MICROBIOLOGY:**

Immunity, Hepatitis B and its prophylaxis, Knowledge of organisms, commonly associated with diseases of oral cavity, culture and sensitivity tests, various staining techniques-Smears and cultures, urine analysis and culture.

**ORAL PATHOLOGY AND MICROBIOLOGY:**

Developmental disturbances of oral and para oral structures, regressive changes of teeth, bacterial, viral, mycotic infection of oral cavity, Dental caries, diseases of pulp and Periapical tissues, physical and chemical injuries of oral cavity, wide range of pathological lesions of hard and soft tissues of the orofacial regions like cysts, odontogenic infection, benign & malignant neoplasms, salivary gland diseases, maxillary sinus diseases, mucosal diseases, oral aspects of various systemic diseases & role of laboratory investigation in oral surgery.

**PHARMACOLOGY AND THERAPEUTICS:**

Definition of terminology used, pharmacokinetics and pharmacodynamic dosage and mode of administration of drugs, action and fate in the body, drug addiction, tolerance and hypersensitivity reactions, drugs acting on CNS, general and local anesthetics, antibiotics and analgesics, antiseptics, antitubercular, sialogogues, hematinics, anti diabetic, Vitamins A, B-complex, C,D,E,K

**COMPUTER SCIENCE:**

Use of computers in surgery, components of computer and its use in practice, principles of word processing, spreadsheet function database and presentations; the internet and its use. The value of computer based systems in biomedical equipment.

**ORAL AND MAXILLOFACIAL SURGERY:**

- Evolution of Maxillofacial surgery.
- Diagnosis, history taking, clinical examination, investigations.
- Informed consent/medico-legal issues.
- Concept of essential drugs and rational use of drugs.
- Communication skills with patients- understanding, clarity in communication, compassionate explanations and giving emotional support at the time of suffering and bereavement
- Principles of surgical audit - understanding the audit of process and outcome. Methods adopted for the same. Basic statistics.
- Principles of evidence based surgery- understanding journal based literature study; the value of textbook, reference book articles, value of review articles; original articles and their critical assessment, understanding the value of retrospective, prospective, randomized control and blinded studies, understanding the principles and the meaning of various Bio-statistical tests applied in these studies.
- Principles of surgery- developing a surgical diagnosis, basic necessities for surgery, aseptic technique, incisions, flap designs, tissue handling, hemostasis, dead space management, decontamination and debridement, suturing, edema control, patient general health and nutrition.
- Medical emergencies - Prevention and management of altered consciousness, hyper sensitivity reaction, chest discomfort, respiratory difficulty.
- Pre operative workup - Concept of fitness for surgery; basic medical work up; work up in special situation like diabetes, renal failure, cardiac and respiratory illness; risk stratification
- Surgical sutures, drains
- Post operative care- concept of recovery room care, Airway management, Assessment of Wakefulness, management of cardio vascular instability in this period, Criteria for shifting to the ward, pain management
- Wound management- Wound healing, factors influencing healing, basic surgical techniques, Properties of suture materials, appropriate use of sutures.
- Surgical Infections - Asepsis and antisepsis, Microbiological principles, Rational use of antibiotics, special infections like Synergistic Gangrene and Diabetic foot infection, Hepatitis and HIV infection and cross infection.
- Airway obstruction/management - Anatomy of the airway, principles of keeping the airway patent, mouth to mouth resuscitation, Oropharyngeal airway, endotracheal intubation, Cricothyroidectomy, Tracheostomy.
- Anesthesia - stages of Anesthesia, pharmacology of inhalation, intravenous and regional anesthetics, muscle relaxants.
- Facial pain; Facial palsy and nerve injuries.
- Pain control - acute and chronic pain, cancer and non-cancer pain, patient controlled analgesia

- General patient management - competence in physical assessment of patients of surgery, competence in evaluation of patients presenting with acute injury, particularly to maxillofacial region. Competence in the evaluation of management of patients for Anesthesia
- Clinical oral surgery - all aspects of dento alveolar surgery
- Pre-prosthetic surgery - A wide range of surgical reconstructive procedures involving their hard and soft tissues of the edentulous jaws.
- Temporomandibular joint disorders - TMJ disorders and their sequelae need expert evaluation, assessment and management. It is preferable to be familiar with diagnostic and therapeutic arthroscopic surgery procedures.
- Tissue grafting - Understanding of the biological mechanisms involved in autogenous and heterogeneous tissue grafting.
- Reconstructive oral and maxillofacial surgery - hard tissue and soft tissue reconstruction.
- Cyst and tumors of head and neck region and their management - including principles of tumor surgery, giant cell lesion of jaw bones, fibro osseous lesions of jaw.
- Neurological disorders of maxillofacial region-diagnosis and management of Trigeminal Neuralgia, MPDS, Bells palsy, Frey's Syndrome, Nerve injuries
- Maxillofacial trauma - basic principles of treatment, primary care, diagnosis and management of hard and soft tissue injuries, Comprehensive management including polytrauma patients
- Assessment of trauma-multiple injuries patient, closed abdominal and chest injuries, penetrating injuries, pelvic fractures, urological injuries, vascular injuries.
- Orthognathic surgery - The trainee must be familiar with the assessment and correcting of jaw deformities
- Laser surgery - The application of laser technology in the surgical treatment of lesions amenable to such therapy
- Distraction osteogenesis in maxillofacial region.
- Cryosurgeries - Principles, the application of cryosurgery in the surgical management of lesions amenable to such surgeries.
- Cleft lip and palate surgery- detailed knowledge of the development of the face, head and neck, diagnosis and treatment planning, Current concepts in the management of cleft lip and palate deformity, knowledge of nasal endoscopy and other diagnostic techniques in the evaluation of speech and hearing, concept of multi disciplinary team management.
- Aesthetic facial surgery - detailed knowledge of structures of face & neck including skin and underlying soft tissues, diagnosis and treatment planning of deformities and conditions affecting facial kin, underlying facial muscles, bone, eyelids, external ear etc., surgical management of post acne scarring, face lift, blepharoplasty, otoplasty, facial bone recountouring etc.
- Craniofacial surgery - basic knowledge of developmental anomalies of face, head and neck, basics concept in the diagnosis and planning of various head and neck anomalies including facial cleft, craniosynostosis, syndromes, etc., Current concepts in the management of craniofacial anomalies.
- Head and neck oncology - understanding of the principles of management of head and neck oncology including various pre cancerous lesions, Experience in the surgical techniques of reconstruction following ablative surgery.
- Micro vascular surgery.
- Implantology - principles, surgical procedures for inserti... of various types of implants.
- Maxillofacial radiology/ radio diagnosis
- Other diagnostic methods and imaging techniques

#### **ALLIED SPECIALTIES:**

- General medicine: General assessment of the patient including children with special emphasis on cardiovascular diseases, endocrinal, metabolic respiratory and renal diseases, Blood dyscrasias
- General surgery: Principles of general surgery, exposure to common general surgical procedures.
- Neuro - surgery: Evaluation of a patient with head injury, knowledge & exposure of various Neuro - surgical procedures
- ENT/Ophthalmology: Examination of ear, nose, throat, exposure to ENT surgical procedures, ophthalmic examination and evaluation, exposure to ophthalmic surgical procedures.

- Orthopedic: basic principles of orthopedic surgery, bone diseases and trauma as relevant to Maxillofacial surgery, interpretation of radiographs, CT, MRI and ultrasound
- Anesthesia: Evaluation of patients for GA technique and management of emergencies, various IV sedation techniques

**Academic Clinical programme (applicable for all three years):**

- **Seminars** to be presented & attended once in a week.
- **Journal clubs** (departmental and interdepartmental) to be conducted once in fifteen days.
- **Departmental and interdepartmental** discussions to be held once in a month.
- Minimum 2 **scientific papers** should be presented.
- Every candidate shall maintain a logbook to record his/her work or participation in all activities such as journal clubs, seminars, CDE programs etc. This work shall be scrutinized and certified by the head of the department and head of the institution and presented to the university every year

**YEAR BY YEAR PROGRAMME:**

**I Year**

**First term:**

Dissection, basic sciences, basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T and ward rounds, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events.

**Second term (rotation and postings in other department):**

Oncology	- 2 months
Emergency	- 1 month
General medicine	- 15 days
General surgery/anesthesia	- 15 days
Ophthalmology	- 15 days
Neurology	- 15 days
ENT	- 15 days
Orthopedic	- 15 days

Examination of basic sciences – one paper of three hours duration to be conducted by the college

**II Year**

Minor oral surgery and higher surgical training

Submission of library assignment by the end of first term

Examination on minor oral surgical procedures - one paper of three hours duration to be conducted by the college.

**III Year**

Maxillofacial surgery, submission of dissertation in the first term, i.e. six months before the final examination to the university.

Examination of three hours duration three months before the final examination to be conducted by the college. It is desirable to enter general surgical skills and operative procedure that are observed, assisted or performed in the log book in the format as given by RGUHS in the revised ordinance governing MDS degree course.

**Final examination** at the end of the third year.

Sl.No	Procedure	Category	Year	Number
1	Injection I.M. and I.V.	PI	I,II	50, 20
2	Minor suturing and removal of sutures	PI	I	N,A
3	Incision & drainage of an abscess	PI	I	10
4	Surgical extraction	PI	I	15
5	Impacted teeth	PI, PA	I, II	20,10
6	Pre prosthetic surgery-	PI	I	15
	a) corrective procedures	PI	I	3
	b) ridge extension	PA	I, II	3
	c) ridge reconstruction	A	II, III	3
7	OAF closure	PI, PA	I, II	3,2
8	Cyst enucleation	PI,PA	I, II	5,5

9	Mandibular fractures	PI,PA	I,II	10,10
10	Peri-apical surgery	PI,PA	I	5
11	Infection management	PI,PA	I, II	N,A
12	Biopsy procedures	PI	I, II	N,A
13	Removal of salivary calculi	PA	I, II	3,5
14	Benign tumors	PA, A	II, III	3,3
15	mid face fractures	PA, A	II, III	3,5
16	Implants	PA,A	II, III	5,5
17	Tracheotomy	PA,A	II, III	2,2
18	Skin grafts	PA	III	3,5
19	Orthognathic surgery	PA,A	II, III	3
20	Harvesting bone & cartilage grafts			3,5
	a) Iliac crest	PA	III	
	b) Rib	A	III	3
	c) Calvarial	A	III	2
	d) Fibula	A,O	III	2
21	T.M. Joint surgery	PA, A	II, I,	1
22	Jaw resections	PA, A	III, II	3,3
23	Onco surgery	A,O	III, III	3,3
24	Micro vascular anastomosis	A,O	III	5,10
25	Cleft lip & palate	PA,A	II, III	10,15
26	Distraction osteogenesis	A,O	II, III	2,3
27	Rhinoplasty	A,O	III	3,5
28	Access osteotomies and base of skull surgeries	A,O	III	1,3

**ORAL AND MAXILLOFACIAL SURGERY****PAPER-I**

**APPLIED BASIC SCIENCES:** Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology and Pharmacology

**APPLIED ANATOMY:**

1. Surgical anatomy of the scalp, temple and face
2. Anatomy of the triangles of neck and deep structures of the neck
3. Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
4. Muscles of head and neck
5. Arterial supply, venous drainage and lymphatics of head and neck
6. Congenital abnormalities of the head and neck
7. Surgical anatomy of the cranial nerves
8. Anatomy of the tongue and its applied aspects
9. Surgical anatomy of the temporal and infratemporal regions
10. Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea esophagus
11. Tooth eruption, morphology, and occlusion.
12. Surgical anatomy of the nose.
13. The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
14. Autonomous nervous system of head and neck
15. Functional anatomy of mastication, deglutition, speech, respiration and circulation
16. Development of face, paranasal sinuses and associated structures and their anomalies
17. TMJ: surgical anatomy and function

**PHYSIOLOGY:****1. Nervous system**

- Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature

2. **Blood**
  - Composition
  - Haemostasis, various blood dyscrasias and management of patients with the same
  - Hemorrhage and its control
  - Capillary and lymphatic circulation.
  - Blood grouping, transfusing procedures.
3. **Digestive system**
  - Saliva - composition and functions of saliva
  - Mastication deglutition, digestion, assimilation
  - Urine formation, normal and abnormal constituents
4. **Respiration**
  - Control of ventilation, anoxia, asphyxia, artificial respiration
  - Hypoxia - types and management
5. **CardioVascular System**
  - Cardiac cycle,
  - Shock
  - Heart sounds,
  - Blood pressure,
  - Hypertension:
6. **Endocrinology**
  - General endocrinal activity and disorder relating to thyroid gland,
  - Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads:
  - Metabolism of calcium
7. **Nutrition**
  - General principles of a balanced diet, effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus.
  - Fluid and Electrolytic balance in maintaining haemostasis and significance in minor and major surgical procedures.

**BIOCHEMISTRY:**

General principles governing the various biological activities of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc.

General composition of the body

Intermediary metabolism

Carbohydrates, proteins, lipids, and their metabolism

Nucleoproteins, nucleic acid and nucleotides and their metabolism

Enzymes, vitamins and minerals

Hormones

Body and other fluids.

Metabolism of inorganic elements.

Detoxification in the body.

Antimetabolites.

**PATHOLOGY:****1. Inflammation -**

- Repair and regeneration, necrosis and gangrene
- Role of component system in acute inflammation,
- Role of arachidonic acid and its metabolites in acute inflammation,
- Growth factors in acute inflammation
- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- Role of NSAIDs in inflammation,
- Cellular changes in radiation injury and its manifestation:

**2. Haemostasis**

- Role of endothelium in thrombogenesis,
- Arterial and venous thrombi,
- Disseminated Intravascular coagulation

**3. Shock:**

- Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock

- Circulatory disturbances, ischemia, hyperemia, venous congestion, edema, infarction
- 4. Chromosomal abnormalities:**
  - Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X- Syndrome
- 5. Hypersensitivity:**
  - Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction ar its clinical importance, systemic lupus erythematosus.
  - Infection and infective granulomas.
- 6. Neoplasia:**
  - Classification of tumors.
  - Carcinogenesis and carcinogen- chemical, viral and microbial
  - Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors
  - Characteristics of benign and malignant tumors
- 7. Others:**
  - Sex linked agammaglobulinemia.
  - AIDS
  - Management of immun deficiency patients requiring surgical procedures
  - De George Syndrome
  - Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis.
- 8. Oral Pathology:**
  - Developmental disturbances of oral and Para oral structures
  - Regressive changes of teeth.
  - Bacterial, viral and mycotic infections of oral cavity
  - Dental caries,, diseases of pulp and periapical tissues
  - Physical and chemical injuries of the oral cavity
  - Oral manifestations of metabolic and endocrinal disturbances
  - Diseases of jawbones and TMJ
  - Diseases of blood and blood forming organs in relation to oral cavity
  - Cysts of the oral cavity
  - Salivary gland diseases
  - Role of laboratory investigations in oral surgery
- 9. Microbiology:**
  - Immunity
  - Knowledge of organisms commonly associated with disease of oral cavity.
  - Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organism, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliasis
  - Hepatitis B and its prophylaxis
  - Culture and sensitivity test
  - Laboratory determinations
  - Blood groups, blood matching, RBC and WBC count
  - Bleeding and clotting time etc, smears and cultures,
  - Urine analysis and cultures.

#### **APPLIED PHARMACOLOGY AND THERAPEUTICS:**

1. Definition of terminologies used
2. Dosage and mode of administration of drugs.
3. Action and fate of drugs in the body
4. Drug addiction, tolerance and hypersensitivity reactions.
5. Drugs acting on the CNS
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers.
7. Chemo therapeutics and antibiotics
8. Analgesics and antipyretics
9. Antitubercular and antisiphilitic drugs.
10. Antiseptics, sialogogues and antisialogogues
11. Haematinics
12. Antidiabetics
13. Vitamins A, B-complex, C, D, E, K



**PAPER-II : Minor Oral Surgery and Trauma****MINOR ORAL SURGERY:**

- **PRINCIPLES OF SURGERY:** DEVELOPING A SURGICAL DIAGNOSIS, BASIC NECESSITIES FOR SURGERY, ASEPTIC TECHNIQUE, INCISIONS, FLAP DESIGN TISSUE HANDLING, HAEMOSTASIS, DEAD SPACE MANAGEMENT, DECONTAMINATION AND DEBRIDEMENT, SUTURING, OEDEMA CONTROL, PATIENT GENERAL HEALTH AND NUTRITION.
- **MEDICAL EMERGENCIES:** prevention and management of altered consciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty.
- 1. **EXAMINATION AND DIAGNOSIS:** clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients.
- 2. **HAEMORRHAGE AND SHOCK:** applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock.
- 3. **EXODONTIA:** principles of extraction, indications and contraindications, types of extraction, complications and their management, principles of elevators and elevators used in oral surgery.
- 1. **IMPACTION:** surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management.
- 5. **SURGICAL AIDS TO ERUPTION OF TEETH:** surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth.
- 5. **TRANSPLANTATION OF TEETH**
- 7. **SURGICAL ENDODONTICS:** indications and contraindications, diagnosis, procedures of periradicular surgery
- 1. **PREPROSTHETIC SURGERY:** requirements, types (alveoplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty)
- 1. **PROCEDURES TO IMPROVE ALVEOLAR SOFT TISSUES:** hypermobile tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy
- 0. **INFECTION OF HEAD AND NECK:** Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis.
- 1. **CHRONIC INFECTIONS OF THE JAWS:** Osteomyelitis (types, etiology, pathogenesis, management) osteoradionecrosis
- 2. **MAXILLARY SINUS:** maxillary sinusitis - types, pathology, treatment, closure of Oro - antral fistula, Caldwell- luc operation
- 3. **CYSTS OF THE OROFACIAL REGION:** classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula
- 4. **NEUROLOGICAL DISORDERS OF THE MAXILLOFACIAL REGION:** diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries.
- 5. **IMPLANTOLOGY:** definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure.
- 6. **ANESTHESIA**
  - LOCAL ANESTHESIA:**  
Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management.
  - GENERAL ANESTHESIA:**  
Classification, stages of GA, mechanism of action, indications, and contra indications, advantages and disadvantages, post anesthetic complications and emergencies, anesthetic for dental procedures in children, pre medication, conscious sedation, legal aspects for GA
- 7. **TRAUMA**
  - 3. **SURGICAL ANATOMY OF HEAD AND NECK.**
  - 3. **ETIOLOGY OF INJURY.**
  - 2. **BASIC PRINCIPLES OF TREATMENT**
  - 1. **PRIMARY CARE:** resuscitation, establishment of airway, management of hemorrhage, management of head injuries and admission to hospital.
  - 2. **DIAGNOSIS:** clinical, radiological

23. **SOFT TISSUE INJURY OF FACE AND SCALP:** classification and management of soft tissue wounds, injuries to structure requiring special treatment.
24. **DENTO ALVEOLAR FRACTURES:** examination and diagnosis, classification, treatment, prevention.
25. **MANDIBULAR FRACTURES:** classification, examination and diagnosis, general principles of treatment, complications and their management
26. **FRACTURE OF ZYGOMATIC COMPLEX:** classification, examination and diagnosis, general principles of treatment, complications and their management.
27. **ORBITAL FRACTURES:** blow out fractures
28. **NASAL FRACTURES**
29. **FRACTURES OF MIDDLE THIRD OF THE FACIAL SKELETON:** emergency care, fracture of maxilla, and treatment of the first, second, third, fractures of the naso-orbito-ethmoidal region.
30. **OPHTHALMIC INJURIES:** minor injuries, non-perforating injuries, perforating injuries, retrobulbar hemorrhage, and traumatic optic neuropathy.
31. **TRAUMATIC INJURIES TO FRONTAL SINUS:** diagnosis, classification, treatment
32. **MAXILLOFACIAL INJURIES IN GERIATRIC AND PEDIATRIC PATIENTS.**
33. **GUN SHOT WOUNDS AND WAR INJURIES**
34. **OSSEointegration in MAXILLOFACIAL RECONSTRUCTION**
35. **METABOLIC RESPONSE TO TRAUMA:** neuro-endocrine responses, inflammatory mediators, clinical implications
36. **HEALING OF TRAUMATIC INJURIES:** soft tissues, bone, cartilage, response of peripheral nerve to injury
37. **NUTRITIONAL CONSIDERATION FOLLOWING TRAUMA.**
38. **TRACHEOSTOMY:** indications and contraindications, procedure, complications and their management.

**PAPER-III : MAXILLOFACIAL SURGERY**

**Salivary gland**

- Sialography
- Salivary fistula and management
- Diseases of salivary gland - developmental disturbances, cysts, inflammation and sialolithiasis
- Mucocoele and Ranula
- Tumors of salivary gland and their management
- Staging of salivary gland tumors
- Parotidectomy

**Temporomandibular Joint**

- Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint disorders
- Ankylosis and management of the same with different treatment modalities
- MPDS and management
- Condylectomy - different procedures
- Various approaches to TMJ
- Recurrent dislocations - Etiology and Management

**Oncology**

- Biopsy
- Management of pre-malignant tumors of head and neck region
- Benign and Malignant tumors of Head and Neck region
- Staging of oral cancer and tumor markers
- Management of oral cancer
- Radical Neck dissection
- Modes of spread of tumors
- Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible
- Radiation therapy in maxillofacial regions
- Lateral neck swellings

**Orthognathic surgery**

- Diagnosis and treatment planning

- Cephalometric analysis
  - Model surgery
  - Maxillary and mandibular repositioning procedures
  - Segmental osteotomies
  - Management of apertognathia
  - Genioplasty
  - Distraction osteogenesis
- Cysts and tumor of oro facial region**
- Odontogenic and non-Odontogenic tumors and their management
  - Giant Cell lesions of jawbone
  - Fibro osseous lesions of jawbone
  - Cysts of jaw
- Laser surgery**
- The application of laser technology in surgical treatment of lesions
- Cryosurgery**
- Principles, applications of cryosurgery in surgical management
- Cleft lip and palate surgery**
- Detailed knowledge of the development of the face, head and neck
  - Diagnosis and treatment planning
  - Current concepts in the management of cleft lip and palate deformity
  - Knowledge of Naso endoscopy and other diagnostic techniques in the evaluation of speech and hearing
  - Concept of multidisciplinary team management
- Aesthetic facial surgery**
- Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue
  - Diagnosis and treatment planning of deformities and conditions affecting facial skin
  - Underlying facial muscles, bone, Eyelids, external ear
  - Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc
- Craniofacial surgery**
- Basic knowledge of developmental anomalies of the face, head and neck
  - Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc.
  - Current concept in the management of Craniofacial anomalies.

#### **MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

#### **SCHEME OF EXAMINATION:**

##### **A. Theory : 400 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

- PAPER-I** : Applied Basic Sciences: Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology and Pharmacology
- PAPER-II** : Minor Oral Surgery and Trauma
- PAPER-III** : Maxillofacial Surgery
- PAPER-IV** : Essay

**B. Practical / Clinical Examination : 200 Marks****1. Minor Oral Surgery - 100 Marks**

Each candidate is required to perform the minor oral surgical procedures under local anaesthesia. The minor surgical cases may include removal of impacted lower third molar, cyst enucleation, any similar procedure where students can exhibit their professional skills in raising the flap, removing the bone and suturing the wound.

2. (a) One long case - 60 marks  
(b) Two short cases - 20 marks each

**C. Viva Voce - 100 Marks***i. Viva-Voce examination: 80 marks*

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

*ii. Pedagogy Exercise: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

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

The following objectives are laid out to achieve the goals of the course. These are to be achieved by the time the candidate completes the course. These objectives may be considered under the following subtitles.

**KNOWLEDGE:**

At the end of 36 months of training, the candidates should be able to:

- Describe aetiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathoses including periodontal situations.
- Demonstrate understanding of basic sciences as relevant to conservative / restorative dentistry and Endodontics.
- Identify social, economic, environmental and emotional determinants in a given case or community and take them into account for planning and execution at individual and community level.
- Ability to master differential diagnosis and recognize conditions that may require multi disciplinary approach or a clinical situation outside the realm of the specialty, which he or she should be able to recognize and refer to appropriate specialist.
- Update himself by self-study and by attending basic and advanced courses, conferences, seminars, and workshops in the specialty of Conservative Dentistry-Endodontics-Dental Materials and Restorative Dentistry.
- Ability to teach/guide, colleagues and other students.
- Use information technology tools and carry out research both basic and clinical with the aim of his publishing his work and presenting the same at scientific platform

**SKILLS:**

- Take proper chair side history, exam the patient and perform medical and dental diagnostic procedures and order as well as perform relevant tests and interpret to them to come to a reasonable diagnosis about the dental condition in general and Conservative Dentistry - Endodontics in particular. And undertake complete patient monitoring including preoperative as well as post operative care of the patient.
- Perform all levels of restorative work and surgical and non-surgical Endodontics including endodontic endosseous implants, as well as endodontic-periodontal surgical procedures as part of multidisciplinary approach to clinical condition.
- Provide basic life saving support in emergency situations.
- Manage acute pulpal and pulpo periodontal situations.

- Have a thorough knowledge of infection control measures in the dental clinical environment and laboratories.

#### **Human Values, Ethical Practice and Communication Abilities**

- Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non-surgical and surgical Endodontics.
- Professional honesty and integrity should be the top priority.
- Dental care has to be provided regardless of social status, caste, creed or religion of the patient.
- Develop communication skills in particular to explain various options available management and to obtain a true informed consent from the patient.
- Apply high moral and ethical standards while carrying on human or animal research
- He/She shall not carry out any heroic procedures and must know his limitations in performing all aspects of restorative dentistry including Endodontics. Ask for help from colleagues or seniors when required without hesitation
- Respect patient's rights and privileges including patients right to information.

#### **COURSE CONTENTS:**

##### **PAPER-I : APPLIED ANATOMY OF HEAD AND NECK**

- Development of face, paranasal sinuses and the associated structures and their anomalies, cranial and facial bones, TMJ anatomy and function, arterial and venous drainage of head and neck, muscles of face and neck including muscles of mastication and deglutition, brief consideration of structures and function of brain. Brief consideration of all cranial nerves and autonomic nervous system of head and neck. Salivary glands, Functional anatomy of mastication, deglutition and speech. Detailed anatomy of deciduous and permanent teeth, general consideration in physiology of permanent dentition, form, function, alignment, contact, occlusion.)
- Internal anatomy of permanent teeth and its significance
- Applied histology – histology of skin, oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

##### **DEVELOPMENT OF TEETH:**

- Enamel – development and composition, physical characteristics, chemical properties, structure
- Age changes – clinical structure
- Dentin – development, physical and chemical properties, structure type of dentin, innervations, age and functional changes.
- Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Cementum – composition, cementogenesis, structure, function, clinical consideration.
- Periodontal ligament – development, structure, function and clinical consideration.
- Salivary glands – structure, function, clinical considerations.
- Eruption of teeth.

##### **APPLIED PHYSIOLOGY:**

- Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration, and endocrinology – general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- Physiology of saliva – composition, function, clinical significance.
- Clinical significance of vitamins, diet and nutrition – balanced diet.
- Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders – typical and atypical, biochemistry such as osmotic pressure, electrolytic dissociation, oxidation, reduction etc. Carbohydrates, proteins, lipids and their metabolism, nucleoproteins, nucleic acid and their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine.

**PATHOLOGY:**

- Inflammation, repair, degeneration, necrosis and gangrene.
- Circulatory disturbances - ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
- Neoplasms - classifications of tumors, characteristics of benign and malignant tumors, spread tumors.
- Blood dyscrasias
- Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures.
- Bacterial, viral, mycotic infections of the oral cavity.

**MICROBIOLOGY:**

- Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes or relevance to dentistry - strepto, staphylococci, lactobacilli, corynebacterium, actinomycetes, clostridium, neisseria, vibrio, bacterioids, fusobacteria, spirochetes, mycobacterium, virus and fungi.
- Cross infection, infection control, infection control procedure, sterilization and disinfection.
- Immunology - antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and aids. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

**PHARMACOLOGY:**

- Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction, tolerance of hypersensitivity reactions.
- Local anesthesia - agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications.
- General anesthesia - pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents used, assessment of anesthetic problems in medically compromised patients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimetic drugs, vitamins and minerals (A, B, C, D, E, K IRON), anti sialogogue, immunosuppressants, drug interactions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS.

**BIOSTATISTICS:**

- Introduction, Basic concepts, Sampling, Health information systems - collection, compilation, presentation of data. Elementary statistical methods - presentation of statistical data, Statistical averages - measures of central tendency, measures of dispersion, Normal distribution. Tests of significance - parametric and non - parametric tests (Fisher exact test, Sign test, Median test, Mann Whitney test, Krusical Wallis one way analysis, Friedmann two way analysis, Regression analysis), Correlation and regression, Use of computers.

**RESEARCH METHODOLOGY:**

- Essential features of a protocol for research in humans
- Experimental and non-experimental study designs
- Ethical considerations of research

**APPLIED DENTAL MATERIALS:**

- Physical and mechanical properties of dental materials, biocompatibility.
- Impression materials, detailed study of various restorative materials, restorative resin and recent advances in composite resins, bonding- recent developments- tarnish and corrosion, dental amalgam, direct filling gold, casting alloys, inlay wax, die materials, investments, casting procedures, defects, dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.
- Dental ceramics-recent advances, finishing and polishing materials.
- Dental burs - design and mechanics of cutting - other modalities of tooth preparation.
- Methods of testing biocompatibility of materials used.

**PAPER-II : CONSERVATIVE DENTISTRY**

1. Examination, diagnosis and treatment plan
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
3. Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, Histopathology, diagnosis, caries activity tests, prevention of dental caries and management - recent methods.
4. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
5. Dental burs and other modalities of tooth reparation- recent developments (air abrasions, lasers etc)
5. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
3. Direct and indirect composite restorations.
9. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and materials.
  - a. Tissue management
10. Impression procedures used for indirect restorations.
11. Cast metal restorations, indications, contraindications, tooth preparation for class 2 inlay, Onlay full crown restorations. Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and
12. Direct gold restorations.
13. Recent advances in restorative materials and procedures.
14. Management of non-carious lesion.
5. Advance knowledge of minimal intervention dentistry.
6. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth
7. Hypersensitivity, theories, causes and management.
8. Lasers in Conservative Dentistry
9. CAD-CAM & CAD-CIM in restorative dentistry
10. Dental imaging and its applications in restorative dentistry (clinical photography)
11. Principles of esthetics
  - Color
  - Facial analysis
  - Smile design
  - Principles of esthetic integration
  - Treatment planning in esthetic dentistry

**PAPER-III : ENDODONTICS**

1. Rationale of Endodontics.
2. Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
3. Dentin and pulp complex.
4. Pulp and periapical pathology
5. Pathobiology of periapex.
6. Diagnostic procedure - recent advances and various aids used for diagnosis-
7. Orofacial dental pain emergencies: endodontic diagnosis and management
8. Case selection and treatment planning
9. Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
10. Access cavity preparation - objectives and principles
11. Endodontic instruments and instrumentation - recent developments, detailed description of hand, rotary, sonic, ultra sonic etc..
1. Working length determination / cleaning and shaping of root canal system and recent development in techniques of canal preparation.
2. Root canal irrigants and intra canal medicaments used including non - surgical Endodontics by calcium hydroxide.
3. Endodontic microbiology.

14. Obturating materials, various obturation techniques and recent advances in obturation of root canal.
15. Traumatic injuries and management – endodontic treatment for young permanent teeth. Pediatric Endodontics – treatment of immature apex.
16. Endodontic surgeries, recent developments in technique and devices, endosseous endodontic implants – biology of bone and wound healing.
17. Endoperio interrelationship, endo.+ Perio lesion and management
18. Drugs and chemicals used in Endodontics
19. Endo emergencies and management.
20. Restoration of endodontically treated teeth, recent advances.
21. Geriatric Endodontics
22. Endo emergencies and management.
23. Biologic response of pulp to various restorative materials and operative procedures.
24. Lasers in Endodontics.
25. Multidisciplinary approach to endodontics situations.
26. Endodontics radiology- digital technology in endodontics practice.
27. Local anesthesia in endodontics.
28. Procedural errors in endodontics and their management.
29. Endodontics failures and retreatment.
30. Resorptions and its management.
31. Microscopes in endodontics.
32. Single visit endodontics, current concepts and controversies.

**TEACHING / LEARNING ACTIVITIES:**

The following is the minimum required to be completed before the candidate can be considered eligible to appear for final MDS exam.

**First Year**

**Pre Clinical Work - Operative and Endodontics**

**Preclinical work on typhodont teeth**

- Class 2 amalgam cavities
  - a. Conservative preparation - 03
  - b. Conventional preparation - 03
- Inlay cavity preparation on premolars  
And molars – MO, DO, MOD
  - a. Wax pattern - 10
  - b. Casing - 06
  - 04
- Onlay preparation on molars
  - a. Casting - 02
  - 01
- Full Crown
  - a. Anterior - 05
  - b. Posterior - 05
  - (2 each to be processed)
- 7/8 crown - 02  
(1 to be processed)
- 3 / 4 crown premolars - 02  
(1 to be processed)

**Pre Clinical work on natural teeth**

- Inlay on molars and premolars MO, DO, and MOD
  - a. Casting - 08
  - b. Wax pattern - 02
  - 02
- Amalgam cavity preparation
  - a. Conventional - 02
  - b. Conservative - 02
- Pin retained amalgam on molar teeth - 02



4. Post and core build up
  - a. Anterior teeth - 10
  - b. Posterior teeth - 05
5. Casting
  - a. Anterior - 04
  - b. Posterior - 02
6. Onlay on molars (1 to be processed) - 03
7. Full crown premolars and molars - 04
8. Full crown anterior (2 and 3 to be processed) - 06
9. Veneers anterior teeth (indirect method) - 02
10. Composite inlay (class 2) (1 to be processed) - 03
11. Full tooth wax carving - all permanent teeth

**ENDODONTICS:**

1. Sectioning of all maxillary and mandibular teeth.
2. Sectioning of teeth - in relation to deciduous molar, 2<sup>nd</sup> primary upper and lower molar 1 each
3. Access cavity opening and root canal therapy in relation to maxillary and mandibular permanent teeth
4. Access cavity preparation and BMP
  - Anterior
    - a. Conventional prep
    - b. Step back
    - c. Crown down
  - Obturation 03
5. BMP Premolar 06 (2 upper and 2 lower) obturation 1 each
6. BMP Molar 06 (3 upper - 2 first molars and 1 second molar, 3 lower - 2 first molars and 1 second molar) obturation 1 each
7. Post and core preparation and fabrication in relation to anterior and posterior teeth
  - a. Anterior 10 (casting 4)
  - b. Posterior 05 (casting 2)
8. Removable dies 04

**Note : Technique work to be completed in the first four months**

**CLINICAL WORK:**

A	Composite restorations	30
B	GIC Restorations	30
C	Complex amalgam restorations	05
D	Composite inlay + veneers (direct and indirect)	05
E	Ceramic jacket crowns	05
F	Post and core for anterior teeth	05
G	Bleaching vital	05
	Non vital	05
H	RCT Anterior	20
I	Endo surgery - observation and assisting	05

**Presentation of:**

- Seminars - 5 seminars by each student - should include topics in dental materials, conservative dentistry and endodontics
- Journal clubs - by each student
- Submission of synopsis at the end of 6 months
- Library assignment work
- Internal assessment - theory and clinicals.

**Second Year****Case discussion- 5**

1	Ceramic jacket crowns	10
2	Post and core for anterior teeth	10
3	Post and core for posterior teeth	05
4	Composite restoration	05
5	Full crown for posterior teeth	15
6	Cast gold inlay	05
7	Other special types of work such as splinting - Reattachment of fractured teeth etc.	05
8	Anterior RCT	20
9	Posterior RCT	30
10	Endo surgery performed independently	05
11	Management of endo - Perio problems	05

- Under graduate teaching program as allotted by the HOD
- Seminars - 5 by each student
- Journal club - 5 by each student
- Dissertation work
- Prepare scientific paper and present in conference and clinical meeting
- Library assignment to be submitted 18 months after starting of the course
- Internal assessment - theory and clinical

**Third Year**

Dissertation work to be submitted 6 months before final examination.

**Clinical work**

- Cast gold inlay- Onlay, cuspal restoration 10
- Post and core 20
- Molar endodontics 50
- Endo surgery 05
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation, endodontic implants.

**Presentation of:**

- Seminars
- Journal club
- Teaching - lecture (under graduates)
- Internal assessment - theory and clinical

**MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

**SCHEME OF EXAMINATION:****A. Theory : 300 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

**PAPER-I :** Applied Basic Sciences: Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.

**PAPER-II :** Conservative Dentistry

**PAPER-III :** Endodontics

**PAPER-IV :** Essay

**B. Clinicals : 200 Marks**

The duration of Clinical and Viva Voce examination will be 2 days for a batch of four students. If the number of candidates exceeds 4, the programme can be extended to 3<sup>rd</sup> day.

**Day 1****Clinical Exercise I - 50 Marks**

Cast core preparation

- |   |            |
|---|------------|
| (i) Tooth Preparation                   | - 10 marks |
| (ii) Direct Wax Pattern                 | - 10 marks |
| (iii) Casting                           | - 10 marks |
| (iv) Cementation                        | - 10 marks |
| (v) Retraction & Elastomeric Impression | - 10 marks |

**Clinical Exercise II - 50 Marks**

Inlay Exercise )

- |  |            |
|--|------------|
| i) Tooth preparation for Class II Gold Inlay | - 25 marks |
| ii) Fabrication of Direct Wax Pattern        | - 25 marks |

**Day 2****Clinical Exercise III - 100 Marks**

Molar Endodontics)

- |   |            |
|---|------------|
| i) Local Anaesthesia and Rubber Dam application | - 20 marks |
| ii) Access Cavity                               | - 20 marks |
| iii) Working length determination               | - 20 marks |
| iv) Canal Preparation                           | - 20 marks |
| v) Master cone selection                        | - 20 marks |

**Viva Voce : 100 Marks**

Viva-Voce examination: 80 marks

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

*Pedagogy Exercise: 20 marks*

topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**Day 3:**

Viva-Voce (Continued if more than 4 students are taking examination or shortage of time on 2<sup>nd</sup> day)

## 5. **ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS**

### **OBJECTIVES:**

The training programme in Orthodontics is to structure and achieve the following four objectives

### **KNOWLEDGE:**

1. The dynamic interaction of biologic processes and mechanical forces acting on the stomatognathic system during orthodontic treatment
2. The etiology, pathophysiology, diagnosis and treatment planning of various common Orthodontic problems
3. Various treatment modalities in Orthodontics preventive interceptive and corrective.
4. Basic sciences relevant to the practice of Orthodontics
5. Interaction of social, cultural, economic, genetic and environmental factors and their relevance to management of oro - facial deformities
6. Factors affecting the long-range stability of orthodontic correction and their management
7. Personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis and HIV and other highly contagious diseases.

### **SKILLS:**

1. To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the Dentofacial deformities.
2. To be competent to fabricate and manage the most appropriate appliance - intra or extra oral, removable or fixed, mechanical or functional, and active or passive - for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of orofacial deformities.

### **ATTITUDES:**

1. Develop an attitude to adopt ethical principles in all aspects of Orthodontic practice.
2. Professional honesty and integrity are to be fostered
3. Treatment care is to be delivered irrespective of the social Status, cast, creed or colleagues
4. Willingness to share the knowledge and clinical experience with professional colleagues
5. Willingness to adopt, after a critical assessment, new methods and techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient
6. Respect patients rights and privileges, including patients right to information and right to seek a second opinion
7. Develop attitude to seek opinion from allied medical and dental specialists as and when required

### **COMMUNICATION SKILLS:**

1. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dentofacial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time.
2. Develop the ability to communicate with professional colleagues, in Orthodontics or other specialities through various media like correspondence, Internet, e-video, conference, etc. To render the best possible treatment.

### **COURSE CONTENT:**

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialities in its scope. A minimum of three years of formal training through a graded system of education as specified, will equip the trainee with skill and knowledge at its completion to be able to practice basic Orthodontics and have the ability to intelligently pursue further apprenticeship towards advanced Orthodontics.

### **SPREAD OF THE CURRICULUM:**

Six months teaching of basic subjects including completion of pre - clinical exercises 2 ½ years of coverage of all the relevant topics in Orthodontics, clinical training involving treatment of patients

and submission of dissertation. These may be divided into blocks of 6 to 8 months duration each, depending on the training policies of each institution.

**I. APPLIED ANATOMY:**

- Prenatal growth of head:  
Stages of embryonic development, origin of head, origin of face, origin of teeth.
- Postnatal growth of head:  
Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, face growth.
- Bone growth:  
Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone
- Assessment of growth and development:  
Growth prediction, growth spurts, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.
- Muscles of mastication:  
Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion
- Development of dentition and occlusion:  
Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.
- Assessment of skeletal age  
The carpal bones, carpal x - rays, cervical vertebrae

**I PHYSIOLOGY:**

- **Endocrinology and its disorders**  
(Growth hormone, thyroid hormone, parathyroid hormone, ACTH) pituitary gland hormones, thyroid gland hormones, parathyroid gland hormones
- **Calcium and its metabolism**
- **Nutrition-metabolism and their disorders:** proteins, carbohydrates, fats, vitamins and minerals.
- **Muscle physiology**
- **Craniofacial Biology:** cell adhesion molecules and mechanism of adhesion
- **Bleeding disorders in orthodontics: Hemophilia**

**II DENTAL MATERIALS:**

- **Gypsum products:** dental plaster, dental stone and their properties, setting reaction etc.
- **Impression materials:** impression materials in general and particularly of alginate impression material.
- **Acrylics:** chemistry, composition physical properties
- **Composites:** composition types, properties setting reaction
- **Banding and bonding cements:** Zn (PO<sub>4</sub>)<sub>2</sub>, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass ionomer cements
- **Wrought metal alloys:** deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
- **Orthodontic arch wires:** stainless steel gold, wrought cobalt chromium nickel alloys, alpha&beta titanium alloys
- **Elastics:** Latex and non-latex elastics.
- **Applied physics,** Bioengineering and metallurgy.
- **Specification and tests methods** used for materials used in Orthodontics
- **Survey of all contemporary literature and Recent advances** in above - mentioned materials.

**7. GENETICS:**

- Cell structure, DNA, RNA, protein synthesis, cell division
- Chromosomal abnormalities
- Principles of orofacial genetics
- Genetics in malocclusion
- 5 Molecular basis of genetics

- Studies related to malocclusion
  - Recent advances in genetics related to malocclusion
  - Genetic counseling
  - Bioethics and relationship to Orthodontic management of patients.
- V. PHYSICAL ANTHROPOLOGY:**
- Evolutionary development of dentition
  - Evolutionary development of jaws.
- VI. PATHOLOGY:**
- Inflammation
  - Necrosis
- VII. BIOSTATISTICS:**
- Statistical principles
    - Data Collection
    - Method of presentation
    - Method of Summarizing
    - Methods of analysis – different tests/errors
  - Sampling and Sampling technique
  - Experimental models, design and interpretation
  - Development of skills for preparing clear concise and cogent scientific abstracts and publication
- VIII. APPLIED RESEARCH METHODOLOGY IN ORTHODONTICS:**
- Experimental design
  - Animal experimental protocol
  - Principles in the development, execution and interpretation of methodologies in Orthodontics
  - Critical Scientific appraisal of literature.
- IX. APPLIED PHARMACOLOGY**
- X. ORTHODONTIC HISTORY:**
- Historical perspective,
  - Evolution of orthodontic appliances,
  - Pencil sketch history of Orthodontic peers
  - History of Orthodontics in India
- XI. CONCEPTS OF OCCLUSION AND ESTHETICS:**
- Structure and function of all anatomic components of occlusion,
  - Mechanics of articulation,
  - Recording of masticatory function,
  - Diagnosis of Occlusal dysfunction,
  - Relationship of TMJ anatomy and pathology and related neuromuscular physiology.
- XII. ETIOLOGY AND CLASSIFICATION OF MALOCCLUSION:**
- A comprehensive review of the local and systemic factors in the causation of malocclusion
  - Various classifications of malocclusion
- XIII. DENTOFACIAL ANOMALIES:**
- Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.
- XIV. CHILD AND ADULT PSYCHOLOGY:**
- Stages of child development.
  - Theories of psychological development.
  - Management of child in orthodontic treatment.
  - Management of handicapped child.
  - Motivation and Psychological problems related to malocclusion / orthodontics
  - Adolescent psychology
  - Behavioral psychology and communication

**XV. DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING IN ORTHODONTICS**

- Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- Problem cases – analysis of cases and its management
- Adult cases, handicapped and mentally retarded cases and their special problems
- Critique of treated cases.
- **Cephalometrics**
- Instrumentation
- Image processing
- Tracing and analysis of errors and applications
- Radiation hygiene
- Advanced Cephalometrics techniques
- Comprehensive review of literature
- Video imaging principles and application.

**XVII. PRACTICE MANAGEMENT IN ORTHODONTICS:**

- Economics and dynamics of solo and group practices
- Personal management
- Materials management
- Public relations
- Professional relationship
- Dental ethics and jurisprudence
- Office sterilization procedures
- Community based Orthodontics.

**XVIII. CLINICAL ORTHODONTICS:****Myofunctional Orthodontics:**

- Basic principles
- Contemporary appliances – their design and manipulation
- Case selection and evaluation of the treatment results
- Review of the current literature.

**Dentofacial Orthopedics**

- Principles
- Biomechanics
- Appliance design and manipulation
- Review of contemporary literature

**Cleft lip and palate rehabilitation:**

- Diagnosis and treatment planning
- Mechanotherapy
- Special growth problems of cleft cases
- Speech physiology, pathology and elements of therapy as applied to orthodontics
- Team rehabilitative procedures.

**Biology of tooth movement:**

- Principles of tooth movement-review
- Review of contemporary literature
- Applied histophysiology of bone, periodontal ligament
- Molecular and ultra cellular consideration in tooth movement

**Orthodontic / Orthognathic surgery:**

- Orthodontist' role in conjoint diagnosis and treatment planning
- Pre and post-surgical Orthodontics
- Participation in actual clinical cases, progress evaluation and post retention study
- Review of current literature

**Ortho / Perio / Prostho inter relationship**

- Principles of interdisciplinary patient treatment
- Common problems and their management





**NON-APPLIANCE EXERCISES**

All the following exercises should be done with 0.7 or 0.8mm wire

Sl.No.	Exercise	No.
1	Straightening of 6" & 8" long wire	1 each
2	Square	1
3	Rectangle	1
4	Triangle of 2" side	1
5	Circle of 2" side	1
6	Bending of 5U's	1
7	Bending of 5V's	1

**2. CLASPS**

Sl.No	Exercise	No.
1	¾ Clasps	2
2	Full clasps	2
3	Triangular Clasps	2
4	Adam's clasp - upper molar	2
5	Adam's Clasp - lower molar	2
6	Adam's Clasp - Pre-molar	2
7	Adam's Clasp - Incisor	2
8	Modification of Adam's - With Helix	2
9	Modification of Adam's - With distal extension	2
10	Modification of Adam's - With soldered tube	2
11	Duyzing Clasps on Molars	2
12	South end Clasp	1

**3. LABIAL BOWS:**

Sl.No.	Exercise	No.
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3	Robert's retractor	1
4	High labial bow-with apron spring's	1
5	Mill's labial bow	1
6	Reverse loop labial bow	1
7	Retention labial bow soldered to Adam's clasp	1
8	Retention labial bow extending distal to second molar	1
9	Fitted labial bow	1
10	Split high labial bow	1

**4. SPRINGS**

Sl.No.	Exercise	No.
1	Finger spring-mesial movement	2
2	Finger spring-distal movement	2
3	Double cantilever spring	2
4	Flapper spring	2
5	Coffin spring	2
6	T spring	2

**5. CANINE RETRACTORS**

Sl.No.	Exercise	No.
1	U loop canine retractor	2PAIRS
2	Helical canine retractor	2PAIRS
3	Palatal canine retractor	2PAIRS
4	Self-supporting canine retractor	2PAIRS
5	Self-supporting canine retractor	2PAIRS

**6. APPLIANCES**

Sl.No.	Exercise
1	Hawley's retention appliance with anterior bite plane
2	Upper Hawley's appliance with posterior bite plane
3	Upper expansion appliance with coffin spring
4	Upper expansion appliance with coffin spring
5	Upper expansion appliance with expansion screw
6	Habit breaking appliance with tongue crib
7	Oral screen and double oral screen
8	Lip bumper
9	Splint for Bruxism
10	Catalans appliance
11	Activator
12	Bionator
13	Frankel-FR 2 appliance
14	Twin block
15	Lingual arch
16	TPA
17	Quad helix
18	Bihelix
19	Utility arches
20	Pendulum appliance

**7. Soldering exercises**

Sl.No.	Exercise	No.
1	Star	1
2	Comb	1
3	Christmas tree	1
4	Soldering buccal tube on molar bands	1

**8. Welding exercises**

Sl.No.	Exercise
1	Pinching and welding of molar, premolar, canine and incisor bands
2	Welding of buccal tubes and brackets on molar bands and incisor bands

**9. Impression of upper and lower arches in alginate****10. Study model preparation****11. Model analysis**

Sl.No.	Exercise
1	Impression of upper and lower dental arches
2	PREPARATION OF STUDY MODEL - 1 And all the permanent dentition analyses to be done.
3	PREPARATION OF STUDY MODEL - 2 And all the permanent dentition analyses to be done.
4	PREPARATION OF STUDY MODEL - 3 And all the mixed dentition analyses to be done.

**12. Cephalometrics**

Sl.No.	Exercise
1	Lateral cephalogram to be traced in five different colors and super imposed to see the accuracy of tracing
2	Steiner's analysis
3	Down's analysis
4	Tweed analysis
5	Rickett's analysis

6	Burrstone analysis
7	Rakosi's analysis
8	Mc Namara analysis
9	Bjork analysis
10	Coben's analysis
11	Harvold's analysis
12	Soft tissue analysis – Holdaway and Burstone

**13. Basics of Clinical Photography including Digital Photography**

**14. Light wire bending exercises for the Begg technique**

Sl.No.	Exercise
1	Wirt bending technique on 0.016' wire circle "Z" Omega
2	Bonwill-Hawley diagram
3	Making a standard arch wire
4	Inter maxillary hooks- Boot leg and Inter Maxillary type
5	Upper and Lower arch wire
6	Bending a double back arch wire
7	Bayonet bends (vertical and horizontal offsets)
8	Stage-III arch wire
9	Torquing auxiliary (upper)
10	Reverse Torquing (lower)
11	Up righting spring

**15. Typhodont exercises: (Begg or P.E.A. method)**

Sl.No	Exercise
1	Teeth setting in Class-II division I malocclusion with maxillary anterior Proclination and mandibular anterior crowding
2	Band pinching, welding brackets and buccal tubes to the bands
3	Stage-I
4	Stage-II
5	Pre Stage-III
6	Stage-III

**CLINICAL WORK:**

Once the basic pre-clinical work is completed the students can take up clinical cases and the clinical training is for the two and half years.

**Each postgraduate student should start with a minimum of 50 cases of his/her own. Additionally he/she should handle a minimum of 20 transferred cases.**

The type of cases can be as follows:

- i. Removable active appliances-5cases
- ii. Class-I malocclusion with Crowding
- iii. Class-I malocclusion with bi-maxillary protrusion
- iv. Class-II division-1
- v. Class-II division-2
- vi. Class-III (Orthopedic, Surgical, Orthodontic cases)
- vii. Inter disciplinary cases
- viii. Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
- ix. Fixed functional appliances – Herbst appliance, jasper jumper etc – 5 cases
- x. Dento-facial orthopedic appliances like head gears, rapid maxillary expansion niti expander etc., - 5 cases
- xi. Appliance for arch development such as molar distalization –m 5 cases
- xiii. Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise)  
Retention procedures of above treated cases.

**Other work to be done during FIRST YEAR**

1. **Seminars:** One Seminar per week to be conducted in the department: A minimum of five seminars should be presented by each student each year
2. **Journal club:** One Journal club per week to be conducted in the department. A minimum of five seminars should be presented by each student each year
3. **Protocol for dissertation to be submitted on or before the end of six months from the date of admission.**
4. **Under graduate classes:** Around 4 - 5 classes should be handled by each post-graduate student
5. **Field survey:** To be conducted and submit the report
6. **Inter-departmental meetings:** should be held once in a month.
7. **Case discussions**
8. **Field visits:** To attend dental camps and to educate the masses
9. **Basic subjects classes**
10. **Internal assessment or Term paper**

**Second Year:**

The clinical cases taken up should be followed under the guidance. More case discussions and cases to be taken up. Other routine work as follows.

1. **Seminars:** One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
2. **Journal club:** One Journal club per week to be conducted in the department. Each student should present a minimum of five seminars each year.
3. **Library assignment to be submitted on or before the end of six months.**
4. **Undergraduate classes:** each post-graduate student should handle Around 4-5 classes.
5. **Inter-departmental meetings:** Should be held once in a month
6. **Case discussions**
7. **Field visits:** To attend dental camps and to educate the masses.
8. **Internal assessment or term paper.**
9. **Dissertation work:** On getting the approval from the university work for the dissertation to be started.

**Third Year:**

The clinical cases taken up should be followed under the guidance. More cases discussions and cases to be taken up. Other routine work as follows:

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

**DISSERTATION:**

- a. The protocol for dissertation should be submitted on or before the end of six months from the date of admission as per calendar of events to the Registrar, Rajiv Gandhi University of Health Sciences, Karnataka, through proper channel.
- b. The completed dissertation should be submitted 6 months before the final examination as per calendar of events to the Registrar (Evaluation), Rajiv Gandhi University of Health Sciences, Karnataka, through proper channel.
- c. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects.
- d. Approval of dissertation is essential before a candidate appears for the University examination.

**MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

**SCHEME OF EXAMINATION:****A. Theory : 300 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

**Paper-I :** Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

**Paper II :** Orthodontic history, Concepts of occlusion and esthetics, Child and Adult Psychology, Etiology and classification of malocclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics

**Paper III :** Clinical Orthodontics

**Paper IV :** Essay

\* The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical / Clinical Examination : 200 Marks****Exercise No: 1 Functional Case : 50 Marks**

Selection of case for functional appliance and recording of construction bite.  
Fabrication and delivery of the appliance the next day.

**Exercise No: 2 Multiband exercise : 50 Marks**

1. III stage with auxiliary springs

OR

2. Bonding of SWA brackets and construction of suitable arch wire.

**Exercise No. 3 Display of records of the treated cases (minimum of 5 cases)**

5 cases \* 15 marks = 75 Marks

**Exercise No: 4 long case discussions: 25 Marks**

No	Exercise	Marks allotted	Approximate Time
1	Functional appliance	50	1 hour 1 hour
2	III stage mechanics / Bonding and arch wire fabrication	50	1 hr 30 min
3	Display of case records (a minimum of 5 cases to be presented with all the cases)	75	1 hour
4	Long cases	25	2 hours

**C. Viva Voce : 100 Marks****i. Viva-Voce examination: 80 marks**

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

**ii. Pedagogy Exercise: 20 marks**

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**6. ORAL PATHOLOGY & ORAL MICROBIOLOGY****OBJECTIVES:**

- To train a post graduate dental surgeon so as to ensure higher competence in both general and special pathology dealing with the nature of oral diseases, their causes, processes and effects.
- An oral pathologist is expected to perform routine histopathological evaluation of specimens relating to oral and perioral tissues, to carry out routine diagnostic procedures including hematological, cytological, microbiological, Immunological and ultra structural investigations.
- He/she is expected to have an understanding of current research methodology, collection and interpretation of data, ability to carry out research projects on clinical and or epidemiological aspects, a working knowledge on current databases, automated data retrieval systems, referencing and skill in writing scientific papers.
- He/she is expected to present scientific data pertaining to the field, in conferences both as poster and verbal presentations and to take part in group discussions.

**BROAD OUTLINE OF THEORETICAL, CLINICAL AND PRACTICAL COURSES**

1. Study of principles of routine and special techniques used for histopathology including principles of histochemistry, Immunochemistry, applied and theoretical biochemical basis of histochemistry as related to oral pathology.
2. Advanced histological and histopathological study of dental and oral tissues including embryonic considerations, clinical considerations, biology, histology, Pathology, prognosis and management of oral oncology, Concepts of oral premalignancy
3. Study of special and applied pathology of oral tissues as well as relation of local pathologic and clinical findings to systemic conditions.
4. Oral microbiology and their relationship to various branches of dentistry.
5. Oral microbiology affecting hard and soft tissues. Study of clinical changes and their significance to dental and oral diseases as related to oral pathology
6. Forensic odontology
7. Inter institutional postings such as cancer hospital, dermatology clinics, regional HIV detection centers, sophisticated instrumentation centers for electron microscopy and other techniques.
8. Maintenance of records of all postgraduates activities.
9. Library assignment.
10. University Dissertation.

**A. COURSE CONTENTS:****First year****1) BIostatistics AND RESEARCH METHODOLOGY:**

- Basic principles of biostatistics and study as applied to dentistry and research
- Collection/organization of data/measurement scales presentation of data and analysis.
- Measures of central tendency.
- Measures of variability.
- Sampling and planning of health survey.
- Probability, normal distribution and indicative statistics.
- Estimating population values.
- Tests of significance (parametric/non-parametric qualitative methods.)
- Analysis of variance
- Association, correlation and regression.

**Approach:**

- Didactic lectures on biostatistics and discussion on research methodology by eminent researchers.
- Two – day P.G. orientation course including general approach PG course, library and main dissertation, journal club topic selection and presentation, seminars, clinico-pathological meets, teaching methodology and use of audiovisual aids.

**2) APPLIED GROSS ANATOMY OF HEAD AND NECK INCLUDING HISTOLOGY:**

- Temporomandibular joint
- Trigeminal nerve and facial nerve
- Muscles of mastication
- Tongue
- Salivary glands
- Nerve supply; blood supply, lymphatic drainage and venous drainage of Oro dental tissues.
- Embryology
  - Development of face, palate, mandible, maxilla, tongue and applied aspects of the same
  - Development of teeth and dental tissues and developmental defects of oral and maxillofacial region and abnormalities of teeth
- Maxillary sinus
- Jaw muscles and facial muscles.

**Genetics:**

Introduction modes of inheritance, chromosomal anomalies of oral tissues and single gene disorders.

**Approach:**

- To be covered as didactic lectures.
- Posting in department of anatomy for dissection of head, face and neck.

**3) PHYSIOLOGY (GENERAL AND ORAL):**

- Saliva
- Pain
- Mastication
- Taste
- Deglutition
- Wound healing
- Vitamins (Influence on growth, development and structure of oral soft and hard tissues and paraoral tissues.)
- Calcium metabolism.
- Theories of mineralization.
- Tooth eruption and shedding.
- Hormones. (Influence on growth, development and structure of oral soft and hard tissues and para oral tissues.)
- Blood and its constituents.

**Approach:**

To be covered as didactic lectures.

**4) CELL BIOLOGY:**

- Cell-structure and function (ultrastructural and molecular aspects), intercellular junctions, cell cycle and division, cell cycle regulators, cell – cell and cell – extra cellular matrix interactions.
- Detailed molecular aspects of DNA, RNA, and intracellular organelles, transcription and translation and molecular biology techniques.

**Approach:**

To be covered as seminars and didactic lecture.

**5) GENERAL HISTOLOGY:**

Light and electron microscopy considerations of Epithelial tissues and glands, bone, hematopoietic system, lymphatic system, muscle, neural tissue, endocrinal system (thyroid, pituitary, parathyroid)

**Approach:**

- Topics to be covered as didactic lectures.
- Postings in the department of anatomy and histology for slide discussion
- Record book to be maintained.

**6) BIOCHEMISTRY:**

- Chemistry of carbohydrates, lipids and proteins.
- Methods of identification and purification.
- Metabolism of carbohydrates, lipids and proteins.
- Biological oxidation.
- Various techniques – cell fractionation and ultra filtration, centrifugation, Electrophoresis, Spectrophotometry, and radioactive techniques.

**Approach:**

- Topics to be covered as didactic lectures.
- Postings to the department of biochemistry to familiarize with various techniques
- Record book to be maintained.

**7) GENERAL PATHOLOGY:**

- Inflammation and chemical mediators, thrombosis, embolism, necrosis, repair, degeneration, shock, hemorrhage pathogenic mechanisms at molecular level and blood dyscrasias, Carcinogenesis and Neoplasia.

**Approach:**

To be covered as seminars and didactic lectures.

**8) GENERAL MICROBIOLOGY:**

- Definitions of various types of infections.
- Routes of infection and spread
- Sterilization, disinfection and antiseptics.
- Bacterial genetics.
- Physiology and growth of microorganisms.

**Approach:**

- To be covered as seminars and didactic lectures.
- Record book to be maintained.

**9) BASIC IMMUNOLOGY:**

- Basic principles of immunity, antigen and antibody reactions.
- Cell mediated immunity and Humoral immunity.
- Immunology of hypersensitivity.
- Immunological basis of the autoimmune phenomena.
- Immunodeficiency with relevance to opportunistic infections.
- Basic principles of transplantation and tumor immunity.

**Approach:**

To be covered as didactic lectures.

**10) SYSTEMIC MICROBIOLOGY/APPLIED MICROBIOLOGY:**

Morphology, classification, pathogenicity, mode of transmission, methods of prevention, collection and transport of specimen, for laboratory diagnosis, staining methods, common culture media, interpretation of laboratory reports and antibiotic sensitivity tests.

- Staphylococci
- Streptococci
- Corynebacterium diphtheria
- Mycobacteria
- Clostridia, bacteroides and fusobacteria
- Actinomycetales
- Spirochetes



**Virology:**

**General properties:** structure, broad classification of viruses, pathogenesis, pathology of viral infections.

**Herpes virus:** list of viruses included, lesions produced, pathogenesis, latency principles and laboratory diagnosis.

**Hepatitis virus:** list of viruses, pathogenesis, and mode of infection, list of diagnostic tests, and their interpretations, methods of prevention and control.

**Human Immunodeficiency virus:** structure with relevance to laboratory diagnosis, type of infection, laboratory tests and their interpretation, universal precautions, specific precautions and recent trends in diagnosis and prophylaxis.

**Mycology:**

- General properties of fungi, classification bases on disease, superficial, subcutaneous, deep opportunistic infections.
- General principles of fungal infections, diagnosis rapid diagnosis method of collection of sample and examination for fungi.

**Approach:**

- To be covered as seminars and didactic lectures
- Postings to the dept. of microbiology to familiarize with relevant diagnostic methods
- Record book to be maintained

**11) ORAL BIOLOGY (ORAL AND DENTAL HISTOLOGY):**

- Structure and function of oral, dental and paraoral tissues including their ultra structure, molecular and biochemical aspects.
- Study of morphology of permanent and deciduous teeth  
(Lectures and practical demonstrations to be given by PG students)

**Approach:**

- To be covered as seminars and didactic lectures.
- Slide discussion on histological appearance of normal oral tissues.
- Record book to be maintained.

**12) BASIC MOLECULAR BIOLOGY AND TECHNIQUES:**

experimental aspects – DNA extraction, PCR, western blotting.

**Approach:**

- To be covered as didactic lectures
- Postings in centers where facilities are available for demonstration of routine molecular biology techniques.
- Record book to be maintained.

**13) BASIC HISTO TECHNIQUES AND MICROSCOPY:**

- Routine hematological tests and clinical significance of the same.
- Biopsy procedures for oral lesions.
- Processing of tissues for Paraffin lesions.
- Microtome and principles of microtomy.
- Routine stains, principles and theories of staining techniques
- Microscope, principles and theories of microscopy.
- Light microscopy and various other types including electron microscopy.
- Methods of tissue preparation for ground sections, decalcified sections.

**Approach:**

- Topics to be covered as seminars.
- Preparation of ground and decalcified sections, tissue processing, sectioning and staining.
- Record book to be maintained

**ACADEMIC ACTIVITIES:**

- Submission of synopsis of dissertation at the end of six months.
- Journal clubs and seminars to be presented by every post graduate student twice a month.
- To attend interdepartmental meetings.
- To attend dental camps based on the survey to be done.
- Part – I year ending examination to be conducted by the college.

**SECOND YEAR**

**ORAL PATHOLOGY**

- Developmental defects of oral and maxillofacial region and abnormalities of teeth
- Dental caries (Introduction, Epidemiology, microbiology, cariogenic bacterial including properties, acid production in plaque, development of lesion, response of dentine - pulp unit, histopathology, root caries, sequelae and immunology).
- Pulpal and Periapical diseases
- Infections of oral and Para oral regions (bacterial, viral and fungal infections)
- Non - neoplastic disorders of salivary glands
- Bone pathology
- Hematological disorders
- Physical and chemical injuries, allergic and Immunological diseases.
- Cysts of odontogenic origin
- Dermatologic diseases.
- Periodontal diseases
- Oral manifestations of systemic diseases
- Facial pain and neuromuscular disorders including TMJ disorders
- Regressive alterations of teeth

**CLINICAL PATHOLOGY:**

- Laboratory investigations - Hematology, Microbiology and Urine analysis
- Postings to Clinical Pathology for relevant training
- Record book to be maintained.

**SPECIALIZED HISTOTECHNIQUES AND SPECIAL STAINS:**

Special staining techniques for different tissues.  
Immunohistochemistry  
Preparation of frozen sections and cytological smears

**Approach:**

Training to be imparted in the department or in other institutions having the facility  
Record book to be maintained

**RECORDING OF CASE HISTORY AND CLINICO-PATHOLOGICAL DISCUSSIONS:**

**Approach:**

Posting to the department of Oral medicine, Diagnosis and Radiology and Oral and Maxillo-facial surgery. Record of case histories to be maintained

**DERMATOLOGY:**

Study of selected mucocutaneous lesions-etiopathogenesis, pathology, clinical presentation and diagnosis.

**Approach:**

- Posting to the dept of Dermatology of a Medical college
- Topics to be covered as Seminars
- Record of cases seen to be maintained.

**ORAL ONCOLOGY:**

Detailed study including Pathogenesis, molecular and biochemical changes of various tumors, tumor like lesions and Premalignant lesions affecting the hard and soft tissues of oral and paraoral tissues. Tumour markers

**Approach:**

To be covered as seminars  
Posting to a Cancer center to amiliarize with the pathological appearances, diagnosis, radio-diagnosis and treatment modalities.

**ORAL MICROBIOLOGY AND IMMUNOLOGY:**

- Normal Oral microbial flora
- Defense mechanism of the oral cavity
- Microbiology and immunology of Dental caries and Periodontal diseases

- Dental caries (Introduction, epidemiology, microbiology, cariogenic bacteria including properties, acid production in plaque, development of lesion, response of dentin-pulp unit, histopathology, root caries, sequelae and immunology)
- Tumor immunology
- Infections of Pulp and Periapical and periodontal tissues
- Oral sepsis and Bacteremia
- Microbial genetics
- Infections of oral and Para oral regions (bacterial, viral and fungal infections)

**Approach:**

To be covered as seminars

**FORENSIC ODONTOLOGY:**

Legal procedures like inquest, medico-legal evidences post mortem examination of violence around mouth and neck, identification of deceased individual-dental importance. Bite marks rugae patterns and lip prints.

**Approach:**

To be covered as seminars

Posting to a Cancer center to familiarize with the pathological appearances, diagnosis, and radio-diagnosis and treatment modalities

**HISTOPATHOLOGY - SLIDE DISCUSSION:**

Record book to be maintained

**LABORATORY TECHNIQUES AND DIAGNOSIS:**

- Routine hematological tests and clinical significance of the same
- Biopsy procedures for oral lesions
- Processing of tissues for Paraffin sections
- Microtome and principles of microtomy
- Routine stains, principles and theories of staining techniques
- Microscope, principles and theories of microscopy
- Light microscopy and various other types including electron microscopy
- Methods of tissue preparation for ground sections, decalcified sections.
- Special stains and staining techniques for different tissues
- Immunohistochemistry
- Preparation of frozen sections and cytological smears

**OTHER TOPICS IN ORAL PATHOLOGY.**

- Detailed description of diseases affecting oral mucosa, teeth, supporting tissues & jaws
- Cysts of the oral & Para-oral regions
- Systemic diseases affecting oral cavity.

**Approach:**

Seminars & Slide discussions. Record notebook to be maintained. Training in histo-pathology slide reporting.

**EXPERIMENTAL ASPECTS OF ORAL DISEASES:**

**Approach:**

Posting is desirable in Centers where animal experimentation is carried out to familiarize with laboratory techniques, upkeep & care of experimental animals.

**RECENT ADVANCES IN ORAL PATHOLOGY:**

**Approach:**

Update of knowledge in Oral Pathology through study of recent journals & Internet browsing. Journal Clubs & Group discussions.

**ACADEMIC ACTIVITIES:**

- Library assignment to be submitted at the end of 6 months
- Commencement of dissertation work
- Journal clubs and seminars to be presented by every PG student
- Clinico - pathological discussions once in a month by every PG student
- To attend interdepartmental meetings.

- Lecture and practical classes and slide discussions to be taken for II BDS students in oral and dental anatomy, dental histology and oral physiology.
- Year ending examination (theory and practical) to be conducted by the college.

**THIRD YEAR**

- Non-neoplastic disorders of salivary glands.
- Bone pathology
- Physical and chemical injuries, allergic and Immunological diseases.
- Cysts of odontogenic origin
- Oral manifestations of systemic diseases

**Approach:**

- To be covered as seminars
- Slide discussions of the same
- Record book to be maintained

**ACADEMIC ACTIVITIES:**

- Visit to center of Animal experimentation to familiarize with Laboratory techniques, upkeep and care of animals
- Completion of Dissertation work and submission of the same, six months before the Final Examination
- Study of Journals, Internet Browsing, and group discussions, to update knowledge in the recent advances in Oral Pathology
- Lecture and Practical demonstrations for third B.D.S students in Oral pathology and Microbiology
- Reporting of histopathology slides
- Journal clubs and Seminars to be presented by every post graduate student twice a month
- Clinico-pathological discussions by every student once in a month
- To attend Inter-departmental meetings.

**MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment is done using checklists that assess various aspects. Checklists are given in Section IV.

**SCHEME OF EXAMINATION:**

**A. Theory 300 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II, III-shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows \*:

- PAPER-I** : Applied Basic Sciences: Applied anatomy, Physiology (General and oral), Cell Biology, General Histology, Biochemistry, General Pathology, General and systemic Microbiology, Virology, Mycology, Basic Immunology, Oral Biology (oral and dental histology), Biostatistics and Research Methodology
- PAPER-II** : Oral pathology, Oral Microbiology & Immunology and Forensic Odontology
- PAPER-III** : Laboratory techniques and Diagnosis and Oncology
- PAPER-IV** : Essay

\* The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical/Clinical - 200 Marks**

- 1. Case Presentation**
  - a) Long case - 20 marks
  - b) Short case - 10 marks

**2. Clinical Hematology** (any two investigations) – 20 Marks  
Hb%, bleeding time, clotting time, Total WBC count, Differential WBC count and ESR

**3. Smear Presentation** - 20 marks  
Cytology or microbial smear and staining

**4. Paraffin sectioning and H & E Staining** - 30 Marks

**5. Histopathology slide discussion** - 100 Marks

**C. Viva Voce 100 Marks**

i. *Viva-Voce examination: 80 marks*

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

ii. *Pedagogy Exercise: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**7. PUBLIC HEALTH DENTISTRY**

**OBJECTIVES:**

At the end of 3 years of training the candidate should be able to:

**KNOWLEDGE:**

- apply basic sciences knowledge regarding etiology, diagnosis and management of the prevention, promotion and treatment of all the oral conditions at the individual and community level.
- Identify social, economic, environmental and emotional determinants in a given individual patient or a community for the purpose of planning and execution of Community Oral Health Program.
- Ability to conduct Oral Health Surveys in order to identify all the oral health problems affecting the community and find solutions using multi – disciplinary approach.
- Ability to act as a consultant in community Oral Health, teach, guide and take part in research (both basic and clinical), present and publish the outcome at various scientific conferences and journals, both national and international level.

**SKILLS:**

The candidate should be able to

1. Take history, conduct clinical examination including all diagnostic procedures to arrive at diagnosis at the individual level and conduct survey of the community at state and national level of all conditions related to oral health to arrive at community diagnosis.
2. Plan and perform all necessary treatment, prevention and promotion of Oral Health at the individual and community level.
3. Plan appropriate Community Oral Health Program, conduct the program and evaluate, at the community level.
4. Ability to make use of knowledge of epidemiology to identify causes and plan appropriate preventive and control measures.
5. Develop appropriate person power at various levels and their effective utilization.
6. Conduct survey and use appropriate methods to impart Oral Health Education.
7. Develop ways of helping the community towards easy payment plan, and followed by evaluation for their oral health care needs.
8. Develop the planning, implementation, evaluation and administrative skills to carry out successful community Oral Health Programs.

**VALUES:**

1. Adopt ethical principles in all aspects of Community Oral Health Activities.
2. To apply ethical and moral standards while carrying out epidemiological researches.
3. Develop communication skills, in particular to explain the causes and prevention of oral diseases to the patient.

4. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed and promote teamwork approach.
5. Respect patient's rights and privileges including patients right to information and right to seek a second opinion.

**COURSE CONTENTS:**

**PAPER-I: Applied Basic Sciences**

**I. APPLIED ANATOMY AND HISTOLOGY:**

**A. Applied Anatomy in relation to:**

- Development of face
- Bronchial arches
- Muscles of facial expression
- Muscles of mastication
- TMJ
- Salivary gland
- Tongue
- Salivary gland
- Tongue
- Hard and soft palate
- Infratemporal fossa
- Paranasal air sinuses
- Pharynx and larynx
- Cranial and spinal nerves- with emphasis on trigeminal, facial, glossopharyngeal and hypoglossal nerve
- Osteology of maxilla and mandible
- Blood supply, venous and lymphatic drainage of head and neck
- Lymph nodes of head and neck
- Structure and relations of alveolar process and edentulous mouth
- Genetics-fundamentals

**B. Oral Histology**

- Development of dentition, Innervations of dentin and pulp
- Periodontium-development, histology, blood supply, nerve supply and lymphatic drainage
- Oral mucous membrane
- Pulp-periodontal complex

**II. APPLIED PHYSIOLOGY AND BIOCHEMISTRY:**

- Cell
- Mastication and deglutition
- Food and nutrition
- Metabolism of carbohydrates, proteins and fats
- Vitamins and minerals
- Fluid and electrolyte balance
- Pain pathway and mechanism-types, properties
- Blood composition and functions, clotting mechanism and erythropoiesis, Blood groups and transfusions, Pulse and blood pressure,
- Dynamics of blood flow
- Cardiovascular homeostasis-heart sounds
- Respiratory system: Normal physiology and variations in health and diseases, Asphyxia and artificial respiration
- Endocrinology: thyroid, parathyroid, adrenals, pituitary, sex hormones and pregnancy, Endocrine regulation of blood sugar.

**III. A. APPLIED PATHOLOGY:**

- Pathogenic mechanism of molecular level
- Cellular changes following injury
- Inflammation and chemical mediators
- Oedema, thrombosis and embolism
- Hemorrhage and shock
- Neoplasia and metastasis
- Blood disorders

- Histopathology and pathogenesis of dental caries, periodontal disease, oral mucosal lesions, and malignancies, HIV
- Propagation of dental infection

**B. MICROBIOLOGY:**

- Microbial flora of oral cavity
- Bacteriology of dental caries and periodontal disease
- Methods of sterilization
- Virology of HIV, herpes, hepatitis
- Parasitology
- Basic immunology – basic concepts of immune system in human body
  - Cellular and humoral immunity
  - Antigen and antibody system
  - Hypersensitivity
  - Autoimmune diseases

**C. ORAL PATHOLOGY:**

- Detailed description of diseases affecting the oral mucosa, teeth, supporting tissues and jaws.

**IV. PHYSICAL AND SOCIAL ANTHROPOLOGY:**

- Introduction and definition
- Appreciation of the biological basis of health and disease
- Evolution of human race, various studies of different races by anthropological methods

**V. APPLIED PHARMACOLOGY:**

- Definition, scope and relations to other branches of medicine, mode of action, bioassay, standardization, pharmacodynamics, pharmacokinetics.
- Chemotherapy of bacterial infections and viral infections – sulphonamides and antibiotics.
- Local anesthesia
- Analgesics and anti-inflammatory drugs
- Hypnotics, tranquilizers and antipyretics
- Important hormones-ACTH, cortisone, insulin and oral antidiabetics.
- Drug addiction and tolerance
- Important pharmacological agents in connection with autonomic nervous system- adrenaline, noradrenaline, atropine
- Brief mention of antihypertensive drugs
- Emergency drugs in dental practice
- Vitamins and haemopoietic drugs

**VI. RESEARCH METHODOLOGY AND BIostatISTICS:**

**HEALTH INFORMATICS** – basic understanding of computers and its components, operating software (Windows), Microsoft office, preparation of teaching materials like slides, project, multimedia knowledge.

**RESEARCH METHODOLOGY** – definitions, types of research, designing written protocol for research, objectivity in methodology, quantification, records and analysis.

**BIostatISTICS** – introduction, applications, uses and limitations of bio – statistics in Public Health dentistry, collection of data, presentation of data, measures of central tendency, measures of dispersion, methods of summarizing, parametric and non parametric tests of significance, correlation and regression, multivariate analysis, sampling and sampling techniques – types, errors, bias, trial and calibration

**COMPUTERS** – Basic operative skills in analysis of data and knowledge of multimedia.

**PAPER-II – Public Health**

**1. PUBLIC HEALTH:**

- Definition, concepts and philosophy of dental health
- History of public health in India and at international level
- Terminologies used in public health

2. **HEALTH:**
  - Definition, concepts and philosophy of health
  - Health indicators
  - Community and its characteristics and relation to health
3. **DISEASE:**
  - Definition, concepts
  - Multifactorial causation, natural history, risk factors
  - Disease control and eradication, evaluation and causation, infection of specific diseases
  - Vaccines and immunization
4. **GENERAL EPIDEMIOLOGY:**
  - Definition and aims, general principles
  - Multifactorial causation, natural history, risk factors
  - Methods in epidemiology, descriptive, analytical, experimental and classic epidemiology of specific diseases, uses of epidemiology
  - Duties of epidemiologist
  - General idea of method of investigating chronic diseases, mostly non-infectious nature, epidemic, endemic, and pandemic.
  - Ethical conversation in any study requirement
  - New knowledge regarding ethical subjects
  - Screening of diseases and standard procedures used
5. **ENVIRONMENTAL HEALTH:**
  - Impact of important components of the environment of health
  - Principles and methods of identification, evaluation and control of such health hazards
  - Pollution of air, water, soil, noise, food
  - Water purification, international standards of water
  - Domestic and industrial toxins, ionizing radiation
  - Occupational hazards
  - Waster disposal- various methods and sanitation
6. **PUBLIC HEALTH EDUCATION:**
  - Definition, aims, principles of health education
  - Health education, methods, models, contents, planning health education programs
7. **PUBLIC HEALTH PRACTICE AND ADMINISTRATION SYSTEM IN INDIA.**
8. **ETHICS AND JURISPRUDENCE:**
  - Basic principles of law
  - Contract laws- dentist – patient relationships & Legal forms of practice
  - Dental malpractice
  - Person identification through dentistry
  - Legal protection for practicing dentist
  - Consumer protection act
9. **NUTRITION IN PUBLIC HEALTH:**
  - Study of science of nutrition and its application to human problem
  - Nutritional surveys and their evaluations
  - Influence of nutrition and diet on general health and oral health, dental caries, periodontal disease and oral cancers
  - Dietary constituents and cariogenicity
  - Guidelines for nutrition
10. **BEHAVIORAL SCIENCES:**
  - Definition and introduction
  - Sociology: social class, social group, family types, communities and social relationships, culture, its effect on oral health.
  - Psychology: definition, development of child psychology, anxiety, fear and phobia, intelligence, learning, motivation, personalities, fear, dentist-patient relationship, modeling and experience



11. **HOSPITAL ADMINISTRATION:**
  - Departmental maintenance, organizational structures
  - Types of practices
  - Biomedical waste management
12. **HEALTH CARE DELIVERY SYSTEM:**
  - International oral health care delivery systems - Review
  - Central and state system in general and oral health care delivery system if any
  - National and health policy
  - National health programme
  - Primary health care - concepts, oral health in PHC and its implications
  - National and international health organizations
  - Dentists Act 1928, Dental council of India, Ethics, Indian Dental Association
  - Role of W.H.O. and Voluntary organizations in Health Care for the Community
13. **ORAL BIOLOGY AND GENETICS:**
  - A detailed study of cell structure
  - Introduction to Genetics, Gene structure, DNA, RNA
  - Genetic counseling, gene typing
  - Genetic approaches in the study of oral disorders
  - Genetic Engineering - Answer to current health problems

**PAPER-III : Dental Public Health**

1. **DENTAL PUBLIC HEALTH:**
  - History
  - Definition and concepts of dental public health
  - Differences between clinical and community dentistry
  - Critical review of current practice
  - Dental problems of specific population groups such as chronically ill, handicapped and institutionalized group
2. **EPIDEMIOLOGY OF ORAL DISEASES AND CONDITIONS:**
  - Dental caries, gingival, periodontal disease malocclusion, dental Fluorosis, oral cancer, TMJ disorders and other oral health related problems.
3. **ORAL SURVEY PROCEDURES:**
  - Planning
  - Implementation
  - WHO basic oral health methods 1997
  - Indices for dental diseases and conditions
  - Evaluation
4. **DELIVERY OF DENTAL CARE:**
  - Dental person power - dental auxiliaries
  - Dentist - population ratios,
  - Public dental care programs
  - School dental health programs- Incremental and comprehensive care
  - Private practice and group practice
  - Oral health policy - National and international policy
5. **PAYMENT FOR DENTAL CARE:**
  - Prepayment
  - Post-payment
  - Reimbursement plans
  - Voluntary agencies
  - Health insurance
6. **EVALUATION OF QUALITY OF DENTAL CARE:**
  - Problems in public and private oral health care system program
  - Evaluation of quality of services, governmental control

7.

**PREVENTIVE DENTISTRY:**

- Levels of prevention
- Preventive oral health programs screening, health education and motivation
- Prevention of all dental diseases-dental caries, periodontal diseases, oral cancer, malocclusion and Dentofacial anomalies
- Role of dentist in prevention of oral diseases at individual and community level.
- Fluoride
  - History
  - Mechanism of action
  - Metabolism
  - Fluoride toxicity
  - Fluorosis
  - Systemic and topical preparations
  - Advantages and disadvantages of each
  - Update regarding Fluorosis
  - Epidemiological studies
  - Methods of fluoride supplements
  - Defluoridation techniques
- Plaque control measures-
  - Health Education
  - Personal oral hygiene
  - Tooth brushing technique
  - Dentifrices, mouth rinses
- Pit and fissure sealant, ART
- Preventive oral health care for medically ill individuals
- Update on recent preventive procedures
- Caries vaccines
- Dietary counselling

8.

**PRACTICE MANAGEMENT:**

- Definition
- Principles of management of dental practice and
- Organization and administration of dental practice
- Ethical and legal issues in dental practice
- Current trends

**STRUCTURED TRAINING SCHEDULE:****First Year****SEMINARS:**

- 5 seminars in basic sciences subjects
- To conduct 10 journal clubs
- Library assignment on assigned topics - 2
- Submission of synopsis for dissertation-within 6 months
- Periodic review of dissertation at two monthly intervals

**CLINICAL TRAINING:**

1. Clinical assessment of patient
2. Learning different criteria and instruments used in various oral indices - 10 each
  - Oral Hygiene Index - Greene and Vermillion
  - Oral Hygiene Index - Simplified
  - DMF - DMF (T), DMF (S)
  - Def
  - Fluorosis Indices - Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thystrup and Fejerskov Index
  - Community Periodontal Index (CPI)
  - Plaque Index-Silness and Loe
  - WHO Oral Health Assessment Form - 1997
  - Carrying out treatment (under comprehensive oral health care) of 10 patients - maintaining complete records.

**FIELD PROGRAMME:**

1. Carrying out preventive programs and health education for school children of the adopted school.
2. School based preventive programs-
  - Topical Fluoride application-Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes, Fluoride mouth rinses
  - Pit and Fissure Sealant -chemically cured (GIC), light cured
  - Minimal Invasive Treatment-Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
  - Organizing and carrying out dental camps in both urban and rural areas.
3. Visit to slum, water treatment plant, sewage treatment plant, and Milk dairy, Public Health Institute, Anti-Tobacco Cell, Primary Health Center and submitting reports.
4. In additions the postgraduate shall assist and guide the under graduate students in their clinical and field programs.

**Second Year****SEMINARS:**

- Seminars in Public Health and Dental Public Health topics
- Conducting journal clubs
- Short term research project on assigned topics - 2
- Periodic review of dissertation at monthly reviews

**CLINICAL TRAINING-CONTINUATION OF THE CLINICAL TRAINING:**

1. Clinical assessment
2. Learning different criteria and instruments used in various oral indices
  - Oral Hygiene Index - Greene and Vermillion
  - Oral Hygiene Index - Simplified
  - DMF - DMF (T), DMF (S)
  - Def t/s
  - Fluorosis Indices - Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thystrup and Fejerskov Index
  - Community Periodontal Index (CPI)
  - Plaque Index-Silness and Loe
  - WHO Oral Health Assessment Form - 1987
  - Carrying out treatment (under comprehensive oral health care) of 10 patients - maintaining complete records

**FIELD PROGRAM - CONTINUATION OF FIELD PROGRAM:**

1. Carrying out school dental health education
2. School based preventive programs-
  - Topical Fluoride application-Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes, Fluoride mouth rinses
  - Pit and Fissure Sealant - chemically cured (GIC), light cured
  - Minimal Invasive Treatment-Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
  - Organizing and carrying out dental camps in both urban and rural areas.
3. Assessing oral health status of various target groups like School children, Expectant mothers Handicapped, Underprivileged, and geriatric populations. Planning dental manpower and financing dental health care for the above group.
4. Application of the following preventive measures in clinic-10 Cases each.
  - Topical Fluoride application - Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes.
  - Pit and Fissure Sealant
5. Planning total health care for school children in an adopted school:
  - a) Periodic surveying of school children
  - b) Incremental dental care
  - c) Comprehensive dental care

6. Organizing and conducting community oral health surveys for all oral conditions-3 surveys
7. In addition the post graduate shall assist and guide the under graduate students in their clinical and field programs
8. To take lecture classes (2) for Undergraduate students in order to learn teaching methods (pedagogy) on assigned topic.

**Third Year:****SEMINARS:**

- Seminars on recent advances in Preventive Dentistry and Dental Public Health
- Critical evaluation of scientific articles - 10 articles
- Completion and submission of dissertation

**CLINICAL TRAINING:**

1. Clinical assessment of patient
2. Learning different criteria and instruments used in various oral indices - 5 each
  - Oral Hygiene Index - Greene and Vermillion
  - Oral Hygiene Index - Simplified
  - DMF - DMF (T), DMF (S)
  - Def t/s
  - Fluorosis Indices - Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
  - Community Periodontal Index (CPI)
  - Plaque Index-Silness and Loe
  - WHO Oral Health Assessment Form - 1987
  - Carrying out treatment (under comprehensive oral health care) of 10 patients - maintaining complete records
3. Carrying out school dental health education
4. School based preventive programs-
  - Topical Fluoride application - Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes.
  - Pit and Fissure Sealant
  - Minimal Invasive Techniques - Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
5. To take lecture classes (2) for Undergraduate students in order to learn teaching methods (pedagogy) on assigned topic
6. Exercise on solving community health problems - 10 problems
7. Application of the following preventive measures in clinic - 10 cases each.
  - Topical Fluoride application - Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations
  - Pit and Fissure sealants
8. Dental - health education training of school teachers, social workers, health workers,
9. Posting at dental satellite centers/ nodal centers
10. In addition the post graduate shall assist and guide the under graduate students in their clinical and field programs

Before completing the third year M.D.S., a student must have attended two national conferences. Attempts should be made to present two scientific papers, publication of a scientific article in a journal.

**MONITORING LEARNING PROCESS:**

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

**SCHEME OF EXAMINATION**

A. Theory : 300 Marks

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

**PAPER-I :** Applied Basic Sciences: Applied Anatomy and Histology, Applied Physiology and Biochemistry, Applied Pathology, Microbiology, Oral Pathology, Physical and Social Anthropology, Applied Pharmacology and Research Methodology and Biostatistics.

**PAPER-II :** Public Health

**PAPER-III:** Dental Public Health

**PAPER-IV:** Essay

Topics of current interest in community oral healths

\* The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical / Clinical Examination : 200 Marks**

1. Clinical examination of at least 2 patients representing the community – includes history, main complaints, examination and recording of the findings, using indices for the assessment of oral health and presentation of the observation including diagnosis, comprehensive treatment planning. (50 Marks – 1 ½ Hrs)
2. Performing
  - a. One of the treatment procedures as per treatment plan. (Restorative, surgical, rehabilitation)
  - b. Preventive oral health care procedure. (50 Marks - 1 ½ Hrs)
  - c. One of the procedures specified in the curriculum
3. Critical evaluation of a given research article published in an international journal (50 Marks – 1 Hour)
4. Problem solving – a hypothetical oral health situation existing in a community is given with sufficient data. The student as a specialist in community dentistry is expected to suggest practical solutions to the existing oral health situation of the given community. (50 Marks – 1 ½ Hours)

**C. Viva Voce : 100 Marks**

i. *Viva-Voce examination: 80 marks*

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

ii. *Pedagogy Exercise: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**8. PAEDODONTICS & PREVENTIVE DENTISTRY**

**OBJECTIVES:**

At the end of 3 years of training the candidate should be able to

1. Create not only a good oral health in the child but also a good citizen tomorrow.
2. Instill a positive attitude and behavior in children
3. Understand the principles of prevention and preventive dentistry right from birth to adolescence
4. Guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry
5. Prevent and intercept developing malocclusion

**SKILLS:**

1. Obtain proper clinical history, methodological examination of the child patient, perform essential diagnostic procedures and interpret them. and arrive at a reasonable diagnosis and treat appropriately
2. Be competent to treat dental diseases which are occurring in child patient.
3. Manage to repair and restore the lost / tooth structure to maintain harmony between both hard and soft tissues of the oral cavity.
4. Manage the disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.
5. To acquire skills in managing efficiency life threatening condition with emphasis on basic life support measure.

**ATTITUDES:**

1. Develop an attitude to adopt ethical principles in all aspects of Pedodontic practice.
2. Professional honesty and integrity are to be fostered
3. Treatment care is to be delivered irrespective of the social status, cast, creed, and religion of the patients.
4. Willingness to share the knowledge and clinical experience with professional colleagues.
5. Willingness to adopt, after a critical assessment, new methods and techniques of Pedodontic management developed from time to time, based on scientific research, which are in the best interest of the child patient.
6. Respect child patient's rights and privileges, including child patients right to information and right to seek a second opinion.
7. Develop an attitude to seek opinion from allied medical and dental specialities, as and when required

**COURSE CONTENTS:**

1. Applied Anatomy & genetics
2. Applied Physiology
3. Applied Pathology
4. Nutrition and Dietics
5. Growth & Development: Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures. Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth.
6. Child Psychology: Development & Classification of behavior, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear anxiety, apprehension & its management
7. Behavior Management: Non-pharmacological & Pharmacological methods.
8. Child Abuse & Dental Neglect
9. Conscious Sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry: (Including Other Drugs, Synergic & Antagonistic Actions of Various Drugs Used in Children)
10. Preventive Pedodontics: Concepts, chair side preventive measures for dental diseases, high-risk caries including rampant & extensive caries - Recognition, Features & Preventive Management, Pit and Fissures Sealants, Oral Hygiene measures, Correlation of brushing with dental caries and periodontal diseases. Diet & Nutrition as related to dental caries. Diet Counseling
11. Dental Plaque: Definition, Initiation, Pathogenesis, Biochemistry, and Morphology & Metabolism.
12. Microbiology & Immunology as related to Oral Diseases in Children: Basic concepts, immune system in human body, Auto Immune diseases, Histopathology, Pathogenesis, Immunology of dental caries, Periodontal diseases, Tumors, Oral Mucosal lesions etc.
13. Gingival & Periodontal diseases in Children:
  - Normal Gingiva & Periodontium in children.
  - Gingival & Periodontal diseases - Etiology, Pathogenesis, Prevention & Management
14. Pediatric Operative Dentistry
  - Principle Of Operative Dentistry along with modifications of materials/past, current & latest including tooth colored materials.
  - 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 material like Glass Ionomer, Composites, Silver, Amalgam & latest material (gallium)
  - Stainless steel, Polycarbonate & Resin Crowns / Veneers & fibre pvit systems.
15. Pediatric Endodontics:
    - a. Primary Dentition: - Diagnosis of pulpal diseases and their management - Pulp capping, Pulpotomy, Pulpectomy (Materials & Methods), Controversies & recent concepts.
    - b. Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.
    - c. Recent advances in Pediatric diagnosis and Endodontics.
  16. Prosthetic consideration in Paediatric Dentistry.
  17. Traumatic Injuries in Children:
    - Classifications & Importance.
    - Sequelae & reaction of teeth to trauma.
    - Management of Traumatized teeth with latest concepts.
    - Management of jaw fracture in children.
  18. Interceptive Orthodontics:
    - a. Concepts of occlusion and esthetics: Structure and function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory function, diagnosis of Occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.
    - b. A comprehensive review of the local and systemic factors in the causation of malocclusion.
    - c. Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).
    - d. Biology of tooth movement: A comprehensive review of the principles of teeth movement. Review of contemporary literature. Histopathology of bone and Periodontal ligament, Molecular and ultra cellular consideration in tooth movement.
    - e. Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
    - f. Removable appliances: Basic principles, contemporary appliances: Design & Fabrication
    - g. Case selection & diagnosis in interceptive Orthodontics (Cephalometrics, Image processing, Tracing, Radiation hygiene, Video imaging & advance Cephalometric techniques).
    - h. Space Management: Etiology, Diagnosis of space problems, analysis, Biomechanics, Planned extraction in interception orthodontics.
  19. Oral Habits in Children:
    - Definition, Etiology & Classification
    - Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
    - Management of oral habits in children
  20. Dental care of Children with special needs:
    - Definition Etiology, Classification, Behavioral, Clinical features & Management of children with:
      - Physically handicapping conditions
      - Mentally compromising conditions
      - Medically compromising conditions
      - Genetic disorders
  21. Oral manifestations of Systemic Conditions in Children & their Management
  22. Management of Minor Oral Surgical Procedures in Children
  23. Dental Radiology as related to Pediatric Dentistry
  24. Cariology
    - 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.

- Subjective & objective methods of Caries detection with emphasis on Caries Activity tests, Caries prediction, Caries susceptibility & their clinical Applications
- 25. Pediatric Oral Medicine & Clinical Pathology: Recognition & Management of developmental dental anomalies, teething disorders, stomatological conditions, mucosal lesions, viral infections etc.
- 26. Congenital Abnormalities in Children: Definition, Classification, Clinical features & Management.
- 27. Dental Emergencies in Children and their Management.
- 28. Dental Materials used in Pediatric Dentistry.
- 29. Preventive Dentistry:
  - Definition
  - Principles & Scope
  - Types of prevention
  - Different preventive measures used in Pediatric Dentistry including fissure sealants and caries vaccine.
- 30. Dental Health Education & School Dental Health Programmes
- 31. Dental health concepts, Effects of civilization and environment, Dental Health delivery system, Public Health measures related to children along with principles of Pediatric Preventive Dentistry
- 32. Fluorides:
  - Historical background
  - Systemic & Topical fluorides
  - Mechanism of action
  - Toxicity & Management.
  - Defluoridation techniques.
- 33. Medicological aspects in Paediatric Dentistry with emphasis on informed concept.
- 34. Counseling in Paediatric Dentistry
- 35. Case History Recording, Outline of principles of examination, diagnosis & treatment planning.
- 36. Epidemiology: Concepts, Methods of recording & evaluation of various oral diseases. Various national & global trends of epidemiology of oral diseases.
- 37. Comprehensive Infant Oral Health Care.
- 38. Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography
- 39. Comprehensive cleft care management with emphasis on counseling, feeding, nasoalvicle bone remodeling, speech rehabilitation.
- 40. Setting up of Pedodontics & Preventive Dentistry Clinic.
- 41. Emerging concept in Paediatric Dentistry of scope of laser/minimum invasive procedures : Paediatric Dentistry.

**First Year****Preclinical Work**

(Duration – first 6 Months of First Year MDS)

(One On Each Exercise)

1. Carving of all deciduous teeth
2. Basic wire bending exercises
3. Fabrication of
  - a. Maxillary bite plate / Hawley's'
  - b. Maxillary expansion screw appliance
  - c. Canine retractor appliance
  - d. All habit breaking appliances
    - i. Removable type
    - ii. Fixed type
    - iii. Partially fixed and removable
  - e. Two Myofunctional appliance
  - f. Making of inclined plane appliance
  - g. Feeding appliances
4. Basic soldering exercise I – making of a lamppost of stainless steel wire pieces of different gauges soldered on either side of heavy gauge main post.
5. Fabrication of space maintainers



- a. Removable type-
  - Unilateral Non - Functional space maintainer
  - Bilateral Non-Functional space maintainer
  - Unilateral functional space maintainer
  - Bilateral functional space maintainer
- b. Space Regainers -
  - Hawley's appliances with Helical space regainer
  - Removable appliance with Slingshot space regainer
  - Removable appliance with Dumbell space regainer
- c. Fixed Space maintainers
  - Band & long loop space maintainer
  - Band & short loop space maintainer
  - Mayne's space maintainer
  - Transpalatal arch space maintainer
  - Nance Palatal holding arch
  - Nance Palatal holding arch with canine stoppers
  - Gerber space regainer
  - Distal shoe appliance
    - a. Active space maintainers
    - b. For guiding the eruption of first permanent molar
    - c. Arch holding device
    - d. Functional space maintainer
6. Basics for spot welding exercise
7. Collection of extracted deciduous and permanent teeth
  - a. Sectioning of the teeth at various levels and planes
  - b. Drawing of section and shapes of pulp
  - c. Phantom Head Exercises : Performing ideal cavity preparation for various restorative materials for both Deciduous and permanent teeth
  - d. Performing pulpotomy, root canal treatment and Apexification procedure
  - i) Tooth preparation and fabrication of various temporary and permanent restorations on fractured anterior teeth.
  - ii) Preparation of teeth for various types of crowns
  - iii) Laminates/veneers
  - iv) Bonding & banding exercise
5. Performing of behavioral rating and IQ tests for children.
6. Computation of: -
  - a. Caries index and performing various caries activity test.
  - b. Oral Hygiene Index
  - c. Periodontal Index
  - d. Fluorosis Index
7. Surgical Exercises : a. Fabrication of splints b. Type of Wiring c. Suturing, various pivot system, pricing & perm. tuli
8. a. Taking of periapical, occlusal, bitewing radiographs of children
  - b. Developing and processing of films, thus obtained
  - c. Tracing of soft tissue dental and skeletal landmarks as observed on Cephalometric radiographs and drawing of various planes and angles, further interpretation of Cephalometric radiographs is analysis.
  - d. Mixed dentition cast analysis
8. Library assignment
9. Synopsis

**Clinical work Requirements from 7 to 36 months**

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear in the final M.D.S Examinations:

No.	Clinical Work	Total	7 To 12 Months	13 To 24 Months	25 To 36 Months
1.	Behavior Management of different age groups children with complete records.	17	2	10	5
2.	Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion	17	2	10	5
3.	Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases & Dental Caries	11	1	5	5
4.	Practical application of Preventive dentistry concepts in a class of 35-50 children & Dental Health Education & Motivation.	7	1	4	2
5.	Pediatric Operative Dentistry with application of recent concepts.				
	(a). Management of Dental Caries				
	(I) Class I	50	30	10	10
	(II) Class II	100	40	50	10
	(III) Other Restorations	100	20	50	30
	(b). Management of traumatized anterior teeth	15	04	06	05
	(c) Aesthetic Restorations	25	05	10	10
	(d). Pediatric Endodontic Procedures				
	• Deciduous teeth				
	• Pulpotomy/Pulpectomy	150	30	50	70
	• Permanent Molars	20	3	7	10
	• Permanent Incisor	15	2	3	10
	• Apexification & Apexogenesis	20	02	08	10
6.	Stainless Steel Crowns	50	10	20	20
7.	Other Crowns	05	01	02	02
8.	Fixed : Space Maintainers Habit breaking appliances	30	08	12	10
9.	Removable : Space Maintainers Habit brceking appliances	20	05	07	08
10.	Functional Appliances	05	01	02	02
11.	Preventive measures like fluoride applications & Pit & Fissure Sealants applications with complete follow-up and diet counseling	20	08	08	04
12.	Special Assignments				
	(i) School Dental Health Programmes	03	01	01	01
	(ii) Camps etc.,	02	01	01	-

13. Library usage

14. Laboratory usage

15. Continuing Dental Health Programme

(The figures given against Sl. No. 4 to 12 are the minimum number of recommended procedures to be performed)

**MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV

**SCHEME OF EXAMINATION:****A. Theory - 300 Marks**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

**PAPER-I : Applied Basic Sciences :** Applied Anatomy, Physiology, Pathology, Microbiology, Nutrition & Dietics, Growth & Development and Dental plaque, Genetics.

**PAPER-II : Clinical Paedodontics**

1. Conscious sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry
2. Gingival & Periodontal Diseases in Children
3. Pediatric Operative Dentistry
4. Pediatric Endodontics
5. Traumatic Injuries in Children
6. Interceptive Orthodontics
7. Oral Habits in children
8. Dental Care of Children with special needs
9. Oral Manifestations of Systemic Conditions in Children & their Management
10. Management of Minor Oral Surgical Procedures in Children
11. Dental Radiology as Related to Pediatric Dentistry
12. Pediatric Oral Medicine & Clinical Pathology
13. Congenital Abnormalities in Children
14. Dental Emergencies in Children & Their Management
15. Dental Materials Used in Pediatric Dentistry
16. Case History Recording
17. Setting up of Pedodontic & Preventive Dentistry Clinic

**PAPER-III: Preventive and Community Dentistry as applied to Pediatric Dentistry**

1. Child Psychology
2. Behavior Management
3. Child Abuse & Dental Neglect
4. Preventive Pedodontics
5. Cariology
6. Preventive Dentistry
7. Dental Health Education & School Dental Health Programmes:
8. Fluorides
9. Epidemiology
10. Comprehensive Infant Oral Health Care/Comprehensive cleft care
11. Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography

**PAPER-IV: Essay**

\*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical Examination : 200 Marks**

The Clinical / Practical and Viva-Voce Examinations are conducted for a minimum of two days.

**First Day:****1. Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar.**

Case Discussion	:	20 marks
Rubber Dam application	:	10 marks
Working length X-ray	:	20 marks
Obturation	:	20 marks
Total	:	<u>70 marks</u>

**2. Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.**

Case discussion	:	10 marks
Crown Preparation	:	20 marks
Crown selection and Cementation	:	20 marks
Total		<u>50 marks</u>

**Case Discussion, band adaptation for fixed type of space maintainer and impression making.**

Case discussion	:	20 marks
Band adaptation	:	20 marks
Impression	:	20 marks
Total		<u>60 marks</u>

**Second Day:**

1. **Evaluation of Fixed Space Maintainer and Cementation** : 20 marks

**C. Viva Voce : 100 Marks**

- i. *Viva-Voce examination: 80 marks*

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

- ii. *Pedagogy Exercise: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**9. ORAL MEDICINE AND RADIOLOGY**

**OBJECTIVES:**

At the end of 3 years of training the candidate should be able to acquire adequate knowledge of the discipline.

**KNOWLEDGE:**

Theoretical, Clinical and practical knowledge of all oral mucosal lesions, skeletal involvement in maxillo-facial region, diagnostic procedures pertaining to them and latest information of imaging modules.

**SKILLS AND ATTITUDE:**

Three important skills need to be imparted and maxillo-facial diseases

1. Diagnostic skill in recognition of oral with radiographic diagnosis and their management
2. Research skills in handling scientific problems pertaining to oral treatment
3. Clinical and Didactic skills in encouraging younger doctors to attain learning objectives

**ATTITUDES:**

The positive mental attitude and the persistence of continued learning need to be inculcated

**COURSE CONTENTS:**

**Paper I: Applied Basic Sciences**

**Applied Anatomy**

1. Gross anatomy of the face:
  - a. Muscles of Facial Expression And Muscles Of Mastication
  - b. Facial nerve
  - c. Facial artery
  - d. Facial vein
  - e. Parotid gland and its relations
2. Neck region:
  - a. Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures

- b. Facial spaces
  - c. Carotid system of arteries, Vertebral Artery, and Subclavian arteries
  - d. Jugular system
    - Internal jugular
    - External jugular
  - e. Lymphatic drainage
  - f. Cervical plane
  - g. Muscles derived from Pharyngeal arches
  - h. Infratemporal fossa in detail and temporomandibular joint
  - i. Endocrine glands
    - Pituitary
  - j. Sympathetic chain
  - k. Cranial nerves- V, VII, IX, XI, & XII
    - Thyroid
    - Parathyroid
  - l. Exocrine glands
    - Parotid
    - Thyroid
    - Parathyroid
3. Oral Cavity:
- a. Vestibule and oral cavity proper
  - b. Tongue and teeth
  - c. Palate – soft and hard
4. Nasal Cavity
- a. Nasal septum
  - b. Lateral wall of nasal cavity
  - c. Paranasal air sinuses
5. Pharynx:
- Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem
- Detailed study of the cranial nerve nuclei of V, VII, IX, X, XI, XII
- Osteology: Comparative study of fetal and adult skull
- Mandible:
- Development, ossification, age changes and evaluation of mandible in detail

#### **EMBRYOLOGY:**

1. Development of face, palate, nasal septum and nasal cavity, paranasal air sinuses
2. Pharyngeal apparatus in detail including the floor of the primitive pharynx
3. Development of tooth in detail and the age changes
4. Development of salivary glands
5. Congenital anomalies of face must be dealt in detail.

#### **HISTOLOGY:**

1. Study of epithelium of oral cavity and the respiratory tract
2. Connective tissue
3. Muscular tissue
4. Nervous tissue
5. Blood vessels
6. Cartilage
7. Bone and tooth
8. Tongue
9. Salivary glands
10. Tonsil, thymus, lymph nodes

#### **PHYSIOLOGY:**

1. General Physiology:
  - Cell
  - Body Fluid Compartments
    - Classification
    - Composition
  - Cellular transport

- RMP and action potential

**MUSCLE NERVE PHYSIOLOGY:**

1. Structure of a neuron and properties of nerve fibers
2. Structure of muscle fibers and properties of muscle fibers
3. Neuromuscular transmission
4. Mechanism of muscle contraction

**BLOOD:**

1. RBC and Hb
2. WBC - Structure and functions
3. Platelets - functions and applied aspects
4. Plasma proteins
5. Blood Coagulation with applied aspects
6. Blood groups
7. Lymph and applied aspects

**RESPIRATORY SYSTEM:**

- Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes
- Lung volumes and capacities and applied aspects
- Oxygen and carbon dioxide transport
- Neural regulation of respiration
- Chemical regulation of respiration
- Hypoxia, effects of increased barometric pressure and decreased barometric pressure

**CARDIO-VASCULAR SYSTEM:**

- Cardiac Cycle
- Regulation of heart rate / Stroke volume / cardiac output / blood flow
- Regulation of blood pressure
- Shock, hypertension, cardiac failure

**EXCRETORY SYSTEM:**

- Renal function tests

**Gastro - intestinal tract:**

Composition, functions and regulation of:

- Saliva
- Gastric juice
- Pancreatic juice
- Bile and intestinal juice
- Mastication and deglutition

**ENDOCRINE SYSTEM:**

- Hormones - classification and mechanism of action
- Hypothalamic and pituitary hormones
- Thyroid hormones
- Parathyroid hormones and calcium homeostasis
- Pancreatic hormones
- Adrenal hormones

**CENTRAL NERVOUS SYSTEM:**

- Ascending tract with special references to pain pathway

**SPECIAL SENSES:**

- Gustation and Olfaction

**BIOCHEMISTRY:**

1. Carbohydrates - Disaccharides specifically maltose, lactose, sucrose  
- Digestion of starch/absorption of glucose

- Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis
  - Blood sugar regulation
  - Glycogen storage regulation
  - Glycogen storage diseases
  - Galactosemia and fructosemia
- 2. Lipids**
- Fatty acids- Essential/non essential
  - Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis
  - Outline of cholesterol metabolism- synthesis and products formed from cholesterol
- 3. Protein**
- Amino acids- essential/non essential, complete/ incomplete proteins
  - Transamination/ Deamination (Definition with examples)
  - Urea cycle
  - Tyrosine-Hormones synthesized from tyrosine
  - In born errors of amino acid metabolism
  - Methionine and transmethylation
- 4. Nucleic Acids**
- Purines/Pyrimidines
  - Purine analogs in medicine
  - DNA/RNA – Outline of structure
  - Transcription/translation
  - Steps of protein synthesis
  - Inhibitors of protein synthesis
  - Regulation of gene function
- 5. Minerals**
- Calcium/Phosphorus metabolism specifically regulation of serum calcium levels
  - Iron metabolism
  - Iodine metabolism
  - Trace elements in nutrition
- 6. Energy Metabolism**
- Basal metabolic rate
  - Specific dynamic action (SDA) of foods
- 7. Vitamins**
- Mainly these vitamins and their metabolic role- specifically vitamin A, Vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

**PATHOLOGY:**

1. Inflammation:
  - Repair and regeneration, necrosis and gangrene
  - Role of complement system in acute inflammation
  - Role of arachidonic acid and its metabolites in acute inflammation
  - Growth factors in acute inflammation
  - Role of molecular events in cell growth and intercellular signaling cell surface receptors
  - Role of NSAIDS in inflammation
  - Cellular changes in radiation injury and its manifestations
- Homeostasis:
  - Role of Endothelium in thrombo – genesis
  - Arterial and venous thrombi
  - Disseminated Intravascular Coagulation
- Shock:
  - Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, edema, infarction
- Chromosomal Abnormalities:
  - Marfan's syndrome
  - Ehler's Danlos Syndrome
  - Fragile X Syndrome

**Hypersensitivity:**

- Anaphylaxis
- Type II Hypersensitivity
- Type III Hypersensitivity
- Cell mediated Reaction and its clinical importance
- Systemic Lupus Erythmatosus
- Infection and infective granulomas

**Neoplasia:**

- Classification of Tumors
- Carcinogenesis & Carcinogens - Chemical, Viral and Microbial
- Grading and Staging of Cancer, tumor Angiogenesis, Paraneoplastic Syndrome
- Spread of tumors
- Characteristics of benign and malignant tumors

**Others:**

- Sex linked agamaglobulinemia
- AIDS
- Management of Immune deficiency patients requiring surgical procedures
- De George's Syndrome
- Ghons complex, post primary pulmonary tuberculosis - pathology and pathogenesis

**PHARMACOLOGY:**

1. Definition of terminologies used
2. Dosage and mode of administration of drugs.
3. Action and fate of drugs in the body
4. Drugs acting on the CNS
5. Drug addiction, tolerance and hypersensitive reactions
6. General and local anesthetics, hypnotics, antiepileptics, and & tranquilizers
7. Chemotherapeutics and antibiotics
8. Analgesics and anti - pyretics
9. Anti - tubercular and anti - syphilitic drugs
10. Antiseptics, sialogogues, and anti - sialogogues
11. Haematinics
12. Anti - diabetics
13. Vitamins - A B Complex, C, D, E, K
14. Steroids

**PAPER-II : Oral And Maxillofacial Radiology**

Study includes Seminars / lectures / Demonstrations

1. History of radiology, structure of x - ray tube, production of x - ray, property of x - rays
2. Biological effects of radiation
3. Filtration of collimation, grids and units of radiation
4. Films and recording media
5. Processing of image in radiology
6. Design of x - ray department, dark room and use of automatic processing units
7. Localization by radiographic techniques
8. Faults of dental radiographs and concept of ideal radiograph
9. Quality assurance and audit in dental radiology
10. Extra - oral-imaging techniques
11. OPG and other radiologic techniques
12. Advanced imaging technique like CT Scan, MRI, Ultrasound & thermo graphic
13. Radio nucleotide techniques
14. Contrast radiography in salivary gland, TMJ, and other radiolucent pathologies
15. Radiation protection and ICRP guidelines
16. Art of radiographic report, writing and descriptors preferred in reports
17. Radiograph differential diagnosis of radiolucent, radio opaque and mixed lesions
18. Digital radiology and its various types of advantages



**PAPER-III : Oral Medicine, therapeutics and laboratory investigations**

1. Study includes seminars / lectures / discussion
2. Methods of clinical diagnosis of oral and systemic diseases as applicable to oral tissue including modern diagnostic techniques
3. Laboratory investigations including special investigations of oral and oro - facial diseases
4. Teeth in local and systemic diseases, congenital, and hereditary disorders
5. Oral manifestations of systemic diseases
6. Oro - facial pain
7. Psychosomatic aspects of oral diseases
8. Management of medically compromised patients including medical emergencies in the dental chair
9. Congenital and Hereditary disorders involving tissues of oro facial region
10. Systemic diseases due to oral foci of infection
11. Hematological, Dermatological, Metabolic, Nutritional, & Endocrinal conditions with oral manifestations
12. Neuromuscular diseases affecting oro -facial region
13. Salivary gland disorders
14. Tongue in oral and systemic diseases
15. TMJ dysfunction and diseases
16. Concept of immunity as related to oro - facial lesions, including AIDS
17. Cysts, Neoplasms, Odontomes, and fibro - osseous lesions
18. Oral changes in Osteo - dystrophies and chondro - dystrophies
19. Pre malignant and malignant lesions of oro facial region
20. Allergy and other miscellaneous conditions
21. Therapeutics in oral medicine -clinical pharmacology
22. Forensic odontology
23. Computers in oral diagnosis and imaging
24. Evidence based oral care in treatment planning
25. Molecular Biology

**ESSENTIAL KNOWLEDGE:**

Basic medical subjects, Oral Medicine, Clinical Dentistry, Management of Medical Emergencies, Oral Radiology, Techniques and Inter - Operation, Diagnosis of Oro - facial Disorders

**PROCEDURAL AND OPERATIVE SKILLS:**

**1<sup>st</sup> Year:**

1. Examination of Patient - Case history recordings - 100  
 - PNAC - 50  
 - Biopsy - 50  
 - Observe, Assist, & Perform under supervision
2. Intra - oral radiographs: -Perform an interpretation - 500

**2<sup>nd</sup> Year:**

1. Dental treatment to medically compromised patients  
 - Observe, assist, and perform under supervision
2. Extra - oral radiographs, digital radiography - 20  
 - Observe, assist and perform under supervision

**Operative skills:**

1. Giving intra - muscular and intravenous injections
2. Administration of oxygen and life saving drugs to the patients
3. Performing basic CPR and certification by Red Cross

**3<sup>rd</sup> Year**

All the above

- Performed independently - Case history: Routine cases - 100
- Interesting Cases - 25
- Intra - oral Radiographs - 100
- Periapical view - 100
- Bitewing view - 50
- Occlusal view - 50
- Extra - oral radiographs of different views - 100

**MONITORING LEARNING PROGRESS:**

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV

**SCHEME OF EXAMINATION:**

**A. Theory**

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

- PAPER-I** : **Applied Basic Sciences** : Applied Anatomy, Physiology, Biochemistry, Pathology, and Pharmacology.
- PAPER-II** : Oral and Maxillofacial Radiology
- PAPER-III** : Oral Medicine, therapeutics and laboratory investigations
- PAPER-IV** : Essay

\* The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

**B. Practical / Clinical Examination : 200 Marks**

**1<sup>st</sup> Day**

<b>Clinical Case Presentation</b>	
2 Spotters	2 x 10 = 20 Marks
2 Short Cases	2 x 15 = 30 Marks
1 Long Case	1 x 50 = 50 Marks
<hr/>	
Total = 100 Marks	

**Radiology Exercise**

- I. A) One Intra Oral Radiograph : 10 Marks
- B) One Occlusal Radiograph : 30 Marks
- II. A) Two Extra Oral Radiograph : 2 x 30 = 60 Marks
- Including technique and interpretation

**2<sup>nd</sup> Day**

**C. Viva Voce : 100 Marks**

i. *Viva-Voce examination: 80 marks*

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

ii. *Pedagogy Exercise: 20 marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

**SECTION-VI**

**ETHICS IN DENTISTRY**

**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, it is desired that all the trainees undergo ethics sensitization by lectures or discussion on ethical issues, discussion of cases with an important ethical component.

### **COURSE CONTENT :**

#### **Introduction to ethics -**

- What are 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, D.C. 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]

#### **Professional 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 out criteria towards decisions

#### **RECOMMENDED READING:**

1. Francis C.M., Medical Ethics, 2<sup>nd</sup> Edn, 2004, Jaypee Brothers, New Delhi.
2. Ethical Guidelines for Biomedical Research on Human Subjects, Indian Council of Medical Research, New Delhi, 2000.

[ADVT-III/IV/98/07 E  
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