2022

GUIDELINES FOR

UNDERGRADUATE DENTAL EDUCATION CURRICULUM (BDS)

+92 051 9190000
info@pmc.org
Mauve Area, G-10/4,
Islamabad, Pakistan

TABLE OF CONTENTS

PREAMBLE

The word Curriculum is derived from a Latin word curare and that means race-course. In simple terms it is the course of study. In dental education it is defined as “Planned educational experience or activity”.

The concept of curriculum is as dynamic as the changes that occur in society. In its narrow sense, curriculum is viewed merely as a listing of subject to be taught in a teaching environment. In a broader sense, it refers to the total learning experiences of individuals not only in institutes but in society as well. There are various models of curriculum, Apprenticeship, discipline-based curriculum, integrated curriculum, Problem based curriculum and Outcome based curriculum.

In Pakistan three models are in practice;

The **Integrated Dental Curriculum** is becoming an increasingly popular concept internationally. An Integrated Dental Curriculum will teach scientific knowledge alongside clinical training, enabling students to learn the material by topic, rather than by discipline. It is different from Traditional Dental curriculum, where you learn the science first in the pre-clinical years and then move on to learning in a clinical setting. Most curricula for Dental education have traditionally been integrated horizontally between basic sciences and clinical sciences.

The goal of integration is to break down the current barriers between the basic and clinical sciences currently in practice with the Traditional Dental Curriculum. Integration should promote retention of knowledge and acquisition of skills through repetitive and progressive development of concepts and their application.

The vertical integration should include not only basic and clinical sciences but also socio-humanistic and population health sciences, leading to a broader conception of ways to teach and learn medicine. An integrated curriculum as “education that is organized in such a way that it cuts across subject matter lines, bringing together various aspects of the curriculum into meaningful association to focus upon broad areas of study.

The **Traditional Dental Curriculum** of teaching medicine implies that students should first learn basic and Para clinical/bio-dental sciences and then move to clinical sciences; however, this is not how patients present in practical settings. A common criticism of this approach is that students will not see the relevance of basic and bio-dental sciences applied to clinical practice, and it is preferable to encourage students to think as doctors from the day they enter dental school. Integration is therefore of key importance in dental education because basic science learning is placed in the context of clinical and professional practice and is considered by students to be more meaningful and relevant.

The **Hybrid Dental Curriculum** where some part of both integrated and traditional curriculum is implemented in a learning environment

In a recent survey conducted under the auspices of PMC where more than (59%) of colleges and Dental University participated; majority of dental colleges and universities in the country are still following traditional or subject based curriculum (66%) with minimal level of either horizontal or vertical integration. (10%) have integrated curriculum and rest follow the hybrid. Almost all followers of traditional/subject based are willing to shift to integrated modular curriculum but desired to have some window period and support from universities

In this document PMC has given broad guidelines and a template of standard curriculum (both traditional and integrated) and competencies to be achieved. Universities are required to develop curricula according to the framework given in the document.

OPERATIONAL DEFINITIONS / GUIDELINES

Following are some important operational definitions for curriculum development

1. Traditional curriculum

The traditional discipline-based curriculum is still being used in some dental schools across the globe, including Pakistan. Students are not exposed to clinical education or patients until the third year of their dental program. During the first two years of their dental education, the curriculum is completely focused on basic and community sciences. The first 2 years are frequently taught in a didactic, discipline-based format.
Discipline based curriculum being the oldest. No effort is made to teach the basic and community sciences in the clinical context. Students have no role in curriculum development and the faculty is not trained to employ modern educational strategies.

2. Integrated Curriculum

It is defined as combining and coordinating the different contents to form a new whole. Horizontal Integration refers to the provision of learning within the structure where individual departments/subject areas contribute to the development and delivery of learning in a meaningful and holistic manner.
In Vertical Integration information during the various curricular phase is taught together focused on key concepts or themes which run throughout all years with revisiting of knowledge. It involves early introduction of clinical skills and their development alongside basic sciences

3. Hybrid Curriculum

It combines didactic courses with clinical rotations to equip students with the necessary skills to become a good and competent doctor. It encompasses both traditional style of teaching and some element of integration. It appears to be more feasible for developing countries

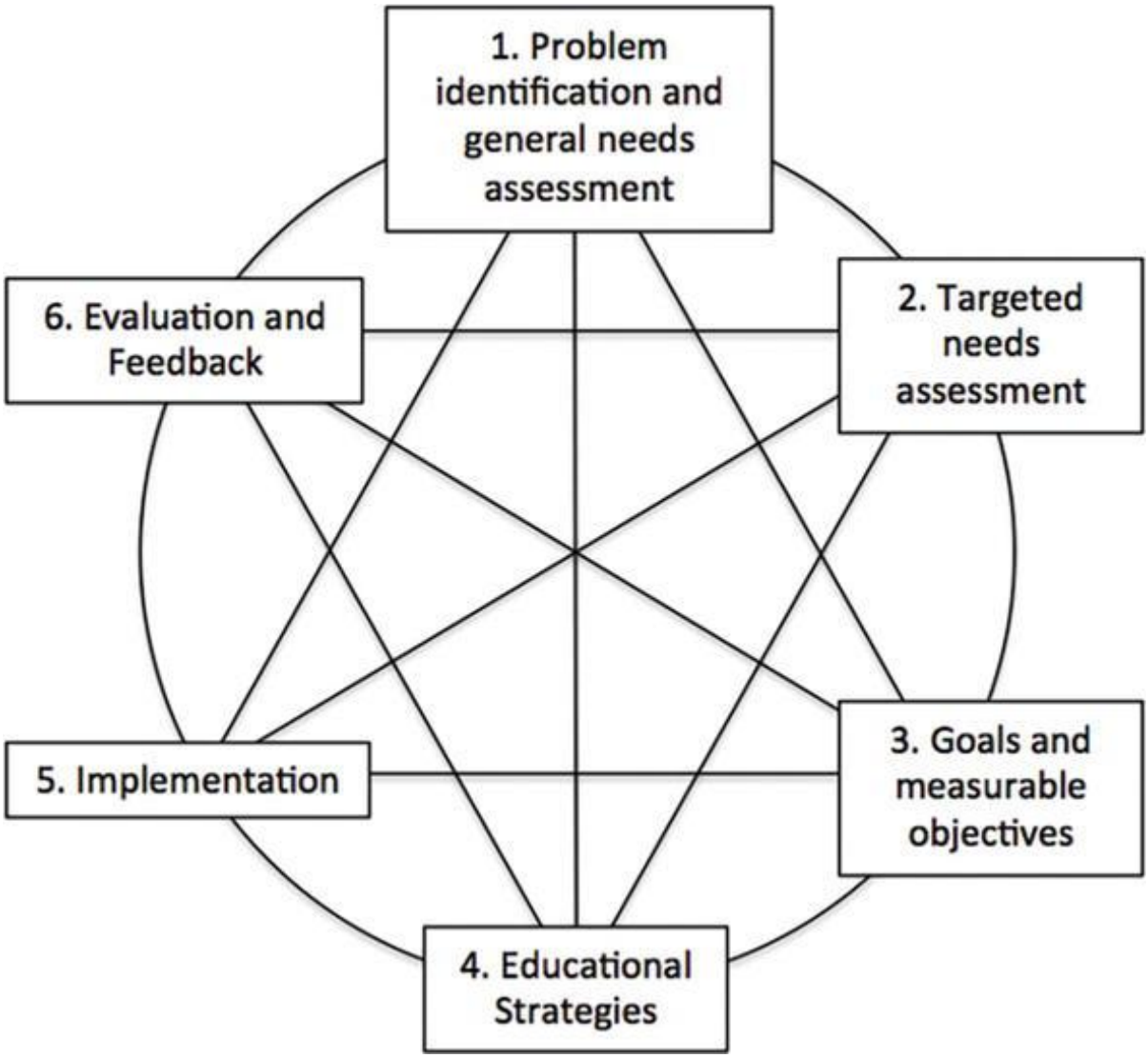
4. Teaching Hours/Study Hours

The clock time duration of all academic activities (other than end-of-year summative assessment) that are documented and reviewable/demonstrable to third-party such as timetabled on-site student activity hours, student assignment hours, student LMS learning hours, practical hours, community visit hours, elective study hours, preparatory and revision student hours (on-campus/off-campus), clinical hours, demonstration hours, formative and summative assessment hours etc), synchronous learning hours and asynchronous learning hours.

Miscellaneous terminology includes null, hidden, co and extra-curriculum

OVERVIEW OF CURRICULUM DEVELOPMENT

Curriculum outcomes should reflect mission and vision statements of the University



**Kern, D. E. (1998). Curriculum development for dental education: A six step approach. Baltimore: Johns Hopkins University Press*

STRATEGIES, GOALS AND GENERAL GUIDELINES FOR CURRICULAR DEVELOPMENT

A Dental curriculum is designed to produce competent, compassionate and efficient professionals capable of caring for the sick. The following defines the characteristics of such an individual:

1.2.1 STANDARDS FOR A SEVEN STAR DENTAL PROFESSIONAL

The expected generic competencies in a dental graduate are as follows:

1. Skillful
2. Knowledgeable
3. Community Health Promoter
4. Critical Thinker
5. Professional
6. Scholar
7. Leader and Role Model

A 'seven-star Dental professional' Pakistani dental graduate should be able to demonstrate various traits as detailed under each competency. These attributes are the bare minimum requirements.

1. SKILLFUL (CLINICAL, COGNITIVE AND PATIENT CARE SKILLS)

Competent dental graduates require sound clinical skills grounded in knowledge of patient-centered care. They should be able to demonstrate that they can::

a. Take a focused history and identify the patient's risk factors with appreciation of the bio-psycho-social model taking into consideration the environment, ethnicity, race, religion, gender, age, sexual orientation, occupation and cultural practices.

b. Perform physical and **psychological** examinations in order to identify specific problems and differentiate those from others and non-conformity to anatomical or physiological configurations.

c. Formulate a provisional diagnosis with justification, and two to three most likely differential diagnoses.

d. Order appropriate investigations and interpret their reports to either confirm the diagnosis or differentiate from others..

e. Perform various common procedures to deal with emergencies in dental clinic; ensuring infection control in taking dental radiographs, dental fillings, tooth extractions, Root canal treatment, pulpotomy/polypectomy, Impression, complete and partial denture fabrication, Dental crowns, scaling and polishing, sub-gingival curettage, administer local anesthesia and block, biopsy, closure / suture of wound, Incision & drainage of alveolar abscess, interceptive procedures in orthodontics, splinting mobile teeth, providing first aid, basic life support and simple suturing of orofacial lacerations. Students should be able to learn and perform these skills in a simulation-based environment (Skills lab), followed by performance on patients.

f. Perform community-based primary oral health care and preventive clinical services using hand instruments and procedures that are non-invasive and do not require local anesthesia such as atraumatic restorations (ART), scaling, splinting mobile and fractured teeth, providing first aid.

g. Implement community-based health promotion and prevention programs

h. Debate the advantages, disadvantages, indications, contraindications

i. Formulate management plans in partnership with patients ensuring their safety by:

- Diagnosing and managing common health problems independently.
- Using cost-effective best evidence patient-safe approaches, reporting adverse drug reactions and drug interactions.
- Recognizing alternate medicine as an option with its effect on health.
- Incorporating patients' concerns, expectations & understanding, determining the extent to which the patients wish to be involved in decision-making, and respecting the decisions and rights of the patients.
- Recognizing, stabilizing (first aid and basic life support), investigating and managing the patient as necessary (Transport, Triage, Neglect, Abuse).
- Being readily accessible when on duty.
- Alleviating pain and distress, including end-of-life care.
- Recognizing and working within the limits of own competence, making use of available resources, and taking advice from colleagues where appropriate, following the consultation process.

j. Advice and counsel the patient and their family members for appropriate health promotion, rehabilitation and support, prevention of risk factors for family members including genetic counseling, immediate treatment and medications, complication and prognosis, using simple terms and lay man language.

k. Educate the patient regarding the health problem, available choices, management plan, self-care, and use of prescribed drugs and equipment.

l. Recognize and take into consideration issues of equality, equity and diversity, and that opportunities are missed if not perceived to be useful by others.

m. Describe and debate the reasons for the success or failures of various approaches to increase prevention and to decrease social inequities

n. Manage time and prioritize tasks and use of resources.

o. Ensure patient safety always including strict infection control practices.

2. KNOWLEDGEABLE (SCIENTIFIC KNOWLEDGE FOR GOOD DENTAL PRACTICE)

This embodies knowledge of basic dental and clinical sciences required for the practice of medicine. A Dental al graduate should be able to:

a. Differentiate between:

- Normal and abnormal structure and functions of the body, to recognize and identify abnormalities in body structure in the context of different diseases.

- Normal and abnormal molecular, cellular, biochemical, and physiological and pathophysiological mechanisms and processes (physical and mental) that maintain and derange the homeostasis, in health and disease.

- **Normal and abnormal human behavior** and relate the abnormality to its psycho-pathological and pathophysiological basis.
- **Effects of growth, development and ageing** upon the individual, family and community in the human life cycle.
- **Biological and social determinants and risk factors of disease**,
- **Various etiological cause(s) and causative agents** for specific injuries, illnesses and diseases.
- **Available therapeutic options** to select the most appropriate treatment modality or drug(s) for common diseases based on pharmaco-dynamics and/or efficacy.
- **Other relevant biochemical, pharmacological, surgical, psychological, social interventions** in acute and chronic illness, rehabilitation and end-of-life care and recognizing the role of religious and cultural interventions in such situations.

b. Relate:

- The effects and interactions of physical, emotional and social environments to health and disease of humans.
- The natural history of acute and chronic, communicable and non-communicable diseases with respective etiologic agents and effect of appropriate interventions on the progress of disease

c. Apply:

- Evidence-based medicine concepts to provide best possible cost-effective care.

d. Ensure:

- Compliance with the legal system as it impacts health care and regulations.
- Patient safety guidelines.

3. COMMUNITY HEALTH PROMOTER (KNOWLEDGE OF POPULATION HEALTH AND HEALTHCARE SYSTEMS)

To deal with problems of population-based primary health care, including health promotion and disease prevention with special emphasis on vulnerable populations, dental graduates require knowledge of population health and healthcare systems. The graduates should understand their role and be able to take appropriate action for protecting and promoting the health of populations. They should be able to:

a. Understand their role and be able to take appropriate action for protecting and promoting the health of their community.

b. Relate effects of lifestyles, genetic, demographic, environmental, social, cultural, economic and psychological **determinants of health** and their impact on the community.

c. Take appropriate action for **infectious, non-communicable disease and injury prevention**, and in protecting, maintaining and promoting the health of individuals, families and communities

d. Evaluate national and global trends in morbidity and mortality of diseases and injuries of social significance, the impact of migration and environmental factors on health and the role of national and international health organizations on health status.

e. Work as an effective member of the healthcare team and demonstrate acceptance of the roles and responsibilities of other health and health related personnel in providing health care to individuals, populations and communities.

f. Adopt a multidisciplinary approach for health promoting interventions which require shared responsibility and partnerships of the health care professions with the population served as well as inter-sectoral collaboration.

g. Apply the basics of health systems including policies, organizations, financing, cost-containment measures of rising healthcare costs, and principles of effective management to the care of populations, families and individuals.

h. Promote and implement mechanisms that **support equity** in access to healthcare and its quality.

i. Make decisions for healthcare using demography, biostatistics and epidemiology as well as national, regional and local surveillance data.

4. CRITICAL THINKER (PROBLEM SOLVING AND REFLECTIVE PRACTICE)

The ability to critically evaluate existing knowledge, technology and information, and to be able to reflect on it, is necessary for solving problems. dental and dental graduates should be able to demonstrate:

a. Use of information obtained and correlated from different sources.

b. Critical data evaluation (interpret, analyze, synthesize, evaluate to form decisions)

c. Dealing effectively with complexity, uncertainty and probability in dental decision-making, reflecting on the latest evidence and its application to health issues.

d. Regular reflection on their practice and standards of dental practice.

e. Initiating, participating in or adapting to change as required, to ensure that the profession and the patients benefit.

f. Flexibility and a problem-solving approach

g. Commitment to quality assurance and monitoring by participating in chart audits and reporting critical incidents to improve dental practice and decrease risk to self, patients and the public.

h. Raising concerns about public risk and patient safety.

5. PROFESSIONAL (BEHAVIOR AND PROFESSIONALISM)

Competent dental graduates require professional values, attitudes and behaviors that embody good dental practice i.e., life-long learning, altruism, empathy, cultural and religious sensitivity, honesty, accountability, probity, ethics, communication skills, and working in teams. The dental graduates should be cognizant of the PMC competencies. Graduates should be role models of their code of conduct, professionalism and values, on and off duty, throughout their lives, and thus lead by example, in order to justify the trust reposed in them by the public. Their behavior must enhance public trust in the profession.

i. Life-long Self-directed Learner

Medical graduates must continually acquire new scientific knowledge and skills to maintain competence and incorporate it into their day-to-day medical practice. For life-long learning, they should demonstrate a desire for continuing medical education during their professional life through personal development activities to continuously acquiring and using new knowledge and technologies. Medical graduates should be able to:

a. Demonstrate continuous learning based on regular self-assessment
b. Seek peer feedback. This also includes a continuous undertaking of self-directed study and credited, continuous medical education activities up to re-licensure and recertification.
c. Manage information effectively to use it for efficient and effective self-learning, medical problem solving and decision-making:

- **accurately document** and maintain records of their practice for better patient care and for analysis and improvement.
- **retrieve patient-specific information** from a clinical data system.
- **using information** and communication technology based on its value and limitations.
- **search, collect, organize and interpret** health and biomedical information from credible databases and sources.
- **match patient information to evidence available in literature** to form judgments for diagnostic, therapeutic, preventive or prognostic decisions and for surveillance and monitoring of health status.

d. Provide evidence of continuing career advancement by pursuing further training in specific fields or continuing professional development (CPD) by attending CPD programs in their primary discipline or as a professional. This evidence may be collated by maintaining professional development portfolios.
e. Function effectively as a mentor and a trainer in order to appraise, assess, teach, and provide feedback to themselves, peers, colleagues and students.
f. Respond positively to appraisals and feedback.

ii. Altruistic and Empathetic

Dental graduates should be able to demonstrate professional values of empathy, altruism and cultural sensitivity in arranging or coordinating the best possible care with:

a. Appropriate **demeanor and dress code**.
b. Responsibility, compassion, empathy, honesty, and integrity.
c. Tolerance for diversity.
d. Caring attitude towards patients and health problems.
e. Put patients first and the patient's needs before their own.
f. Have patient safety as a top priority.
g. Culturally sensitive and respectful of all religious beliefs.
h. Special sensitivity towards vulnerable populations.

iii. Ethical

Dental graduates should be able to demonstrate professional values of self and professional accountability, honesty, probity, and ethics.

a. Without discrimination on the basis of age, gender, religion or beliefs, color, race, ethnic or national origin, culture, disability, disease, lifestyle, marital or parental status, sexual orientation and social or economic status.

b. Strive for constant improvement of self and health delivery systems.
c. Respect the views and interests of the patient and patient's family.
d. Uphold principles of patient autonomy, beneficence, non-maleficence, justice, confidentiality and informed consent.
e. Use moral reasoning in decision-making while dealing with conflicts amongst ethical, legal and professional issues including those raised by economic constraints, commercialization of healthcare, and scientific advances.
f. Being accountable for regulation of self and the profession, through audits and performance reviews, in setting up one's practice and in dealing with pharmaceutical and other commercial enterprises.

iv. Collaborator

The dental graduate should be able to demonstrate skills of teamwork to best serve the interests of the patient, profession and institution by:

a. Working as an effective team member, understanding the importance of each role.
b. Demonstrating collegiality and respect for juniors, peers, seniors and the healthcare team.
c. Continuously assessing themselves and others in their roles and acting accordingly.
d. Sharing information and handing over care appropriately.
e. Focusing on a collegial but problem-solving approach.

v. Communicator

The dental graduates should be able to demonstrate:

a. Non-Verbal communication skills, including active listening, empathy and a caring attitude; and demonstrating considerate and sensitive manners while dealing with patients and their families, nurses, other health professionals, community, the general public and the media.
b. Verbal communication skills, clearly expressing themselves in layman's language; counselling patients sensitively and effectively, providing information in a manner which ensures that patients and families have understood the full information, so that they make educated decisions when consenting to any procedure or therapy; clear, effective and sensitive communication for breaking bad news, dealing with an angry or violent patient, difficult circumstances and vulnerable patients; presentation skills.
c. Written and electronic communication skills, with well-organized, legible, accurate, complete and concise documentation of prescriptions, medical records, procedural and progress notes, discharge summaries and referral letters including all important information and fulfilling medico legal requirements.
d. Confidentiality, and balance confidentiality with public risk.
e. Dissemination of information and research findings to improve health care.

6. SCHOLAR & RESEARCHER

The dental graduates are expected to demonstrate constructive criticism, a spirit of enquiry, creativity and a research-oriented attitude. The graduates should be able to:

a. Identify a researchable problem and critically review the literature

b. Phrase succinct research questions and formulate hypotheses

c. Identify the appropriate research design(s) in epidemiology and analytical tests in biostatistics to answer the research question.

d. Collect, analyze and evaluate data, and present results.

e. Demonstrate ethics in conducting research and in ownership of intellectual property.

7. LEADER AND ROLE MODEL

The dental graduates are expected to demonstrate exemplary conduct and leadership potential in:

a. Advancing healthcare.

b. Enhancing dental education.

c. Initiating, participating in and adapting to change, using scientific evidence and approaches.

d. Enhancing the trust of the public in the medical and dental profession by being exceptional role models at work and also when away.

e. Accepting leadership roles if required.

f. Providing leadership in issues concerning society.

g. Advocate and empower individuals and communities

GUIDELINES/ METHODOLOGY FOR PRODUCING SEVEN-STAR DOCTORS

GUIDELINES/ METHODOLOGY FOR PRODUCING SEVEN-STAR DOCTORS

Following guidelines are meant to facilitate development of educational plan to accomplish desired competencies as defined by PMC:

1. The universities will accommodate traditional and modular forms of curriculum. However, the level of integration in either curriculum should be at level 'seven' (Correlation) or above. In subject-based, the emphasis will be given to bring together the areas of common interest in different subjects. In addition, an integrated teaching session/course must also be introduced.(reference available at: https://www.longdom.org/open-access/curriculum-integration-in-medical-education-a-theoretical-review-ipr.1000113.pdf).

2. The **universities already practicing modular teaching** should continue with their curriculum.

3. Curriculum should have **clearly defined learning outcomes for all competencies** including those of cognition (knowledge), psychomotor (skills), critical thinking, professionalism, research, leadership and role modeling, with a focus on addressing community needs.

4. Curricular document should **outline principles of curricular organization** to clarify how different subjects will combine to promote comprehensive learning.

5. Distribution of curricular hours among different subjects of basic and clinical sciences will be as per PMC recommendations. Curricular plan must span over ***4800 hours*** of learning.

6. Humanities and Elective Rotations outside the parent institutions and affiliated hospitals may be incorporated in the curricular plan for the development of visionary professional.

7. Joint sessions of basic and clinical subjects should be an integral component of timetable where facilitators from different specialties will combine to exhibit clinical problem solving through contribution from different learning domains.

8. Instructional tools for information transfer should be student-centered to groom the student to be a self-directed learner.

9. Early clinical exposure from first year of professional education should be included to facilitate knowledge of basic sciences through applied and practical information transfer.

10. Students should be exposed to clinical environment in-patient, outpatient clinics and Accident and Emergency from first year of their education. It will encourage contextual learning with opportunity to observe how information being learned is practiced in real time.

A: Cognitive Domain

. **Instructional strategies** employed for knowledge transfer should be student centered focusing on principles of active learning e.g., Problem-Based Learning, Case-Based Learning, Team-Based Learning. Teaching should promote group activities in the form of small group discussions, assignments to encourage teamwork, collaboration and peer-assisted learning among students

. **Self-directed learning** should be incorporated by universities during the course of program. It will encourage students to take responsibility of their own learning. Self-directed learning time should precede their work in laboratories, dissection hall and chairside teaching as it will ensure discussion and better understanding among students during their practical work.

B: Psychomotor Domain

. **Skills' Training** should be carried out in laboratories, skill labs and bedside/chairside. The curriculum should have clearly defined learning outcomes for skill acquisition. It should ensure opportunities for students to first observe than do hands-on training under supervision, with the provision of corrective feedback during practice, followed by a supervised, independent performance with due care for patient safety.

. Sufficient opportunities for ***practice, feedback and remediation*** should be provided to students for skill development.

. During clinical training, students should actively participate in ward rounds, patient care in outpatient departments and in Accident and Emergency under close supervision of clinical teachers to allow real life experiences and contextual learning.

. Students' skill training should encompass all common procedures a dental graduate is expected to perform in an independent, non-supervised manner, in accordance with domestic and global trends.

C: Research

. Students should learn the *basic methodology in demography, basic biostatistics and study design of research* and be given opportunities for experiential learning in research.

D: Professionalism, Ethics, Leadership & Role Modeling

. The **Five Pillars of Professionalism** include: personal honesty and integrity; accountability and disclosures of errors; a trust-building patient-doctor relationship with truthfulness, empathy, compassion and cultural sensitivity; knowing one's limitations, self-directed learning and constant improvement; improvement of others and the health systems; and self-regulation and constant improvement of the profession.

. **Training in Affective Domain** should get its due share in the curriculum. Institutions should have dress codes, clearly conveyed rules and regulations and policies in handling misbehavior, bad conduct and negligence. Behavioral sciences should be taught using tools like role play, incidence reporting and reflective exercises to produce well behaved professionals.

. Institutions should **maintain proper record of student's attendance**, participation in academic activities, performance in term and annual assessments. This record should be used for the student's appraisal. Students should be counselled in case of unsatisfactory performance with feedback and identification of corrective measures.

. **Professionalism, ethics, communication skills, leadership, role modelling and patient safety should be essential components in all five years of education** to develop a competent professional. Students should be provided with opportunities for developing and demonstrating altruism, compassion, empathy, a trusting doctor-patient relationship, teamwork and evidence-based medical practice

E: Assessments

. The curriculum must have a **clearly outlined assessment program**. Both formative and summative assessments should be part of the curriculum.

. **Summative assessments** at the end of the session in the form of professional examinations should include an assessment of all competencies in accordance with their weightage in the curriculum. Diverse tools of assessments should be used appropriately to ensure high reliability of results to make valid decisions for pass-fail etc.

. **Assessment should be aligned with the content taught** during the academic year.

. As assessment drives learning, distribution of questions should be in line with the **Table Of Specifications** which should be a mirror image of the curriculum.

. **Transparency, Security and Secrecy of Examinations** are the responsibility of the examining body. Institutions should have clearly documented policies and checks and balances in place to avoid leakage of paper, cheating and frauds during examination.

. Summative examination papers should be *ready at least one month before the examination date*. They should be *finalized by senior faculty members* of the subject, including member(s) from outside the institution.

. Each examination should be followed by a **Post-Exam Analysis**. Examination department should utilize this analysis for continuous improvement of their examinations. The examination department should use post-exam analysis for continuous improvement of the process, by providing guidance to subject specialists.

. Examining Institutions should develop their own **Question Bank** for each subject being taught. Faculty members should regularly contribute questions throughout the academic year to this bank. Committee of subject specialists and educationists should regularly scrutinize these questions for quality before selection for examination.

. In addition to the summative assessments, **Term-Assessments** should be planned in the curriculum during the year to promote learning. Results of these term-assessments should get ***20% weightage in final result***. Curriculum should clearly define timing of assessments, content to be examined and assessment tools to be used for it.

. **Formative Assessment Tools** such as MCQ, SEQ, EMQ, etc. for knowledge, OSCE/OSPE, DOPS, etc. for communication and psychomotor skills should be used to assess students' progress in learning and to give corrective feedback to students that will encourage reflection among students to promote life-long reflective practices. Appropriate tools should be used to assess and provide feedback in professionalism, research, leadership and scholarship.

F: Program Evaluation
. Institution must have a **Curriculum Evaluation Committee** c*omprising of Dental Educationists* who should be entrusted with the responsibility to monitor the curriculum throughout the year to determine whether curriculum has succeeded in producing professionals with desired attributes.
. They should take **regular feedback from all stakeholders** including students, teachers and administration regarding learning activities, difficulties being faced and suggestions for improvement.
. Focus groups should be organized periodically with teachers and students to discuss issues being faced during learning.
. All this information should be used to **modify and improve the curriculum** to enhance and encourage learning.
.The **Academic Program should be periodically reviewed** internally biennially for integrated improvement, to enhance reinforcements and to delete redundancies.

Role Of Universities

Every university has to design its curriculum for all its constituent and affiliated colleges. The PMC will set standards and provide general guidelines for universities to develop their curricula. PMC will not provide a prescriptive curriculum. Following are suggested guidelines:

A Curriculum should:

a. Define the learning outcomes in terms of attitudes, skills and knowledge. While doing so, a few key questions enlighten the path e.g., how were the intended outcomes for the course as a whole and for each part of the course designed and developed? Which stakeholders were involved in their development? How do they relate to the intended career roles of graduates in society? What makes the chosen outcomes appropriate to the social context of the institution?

b. Curricular organization and structure include the curriculum model and inter- relationship of component disciplines. Various models are available from a typical 'Traditional' (subject-based) to 'Trans-disciplinary' (modular, integrated). The choice of curriculum design is dictated by its mission, intended outcomes, context and resources of the institution. Key questions to consider are: What are the principles behind the institution's curriculum design? What is the relationship between the different disciplines of study which the curriculum encompasses? How were the model of curriculum organization chosen? To what extent was the model constrained by local regulatory requirements? How does the curriculum design support the mission of the institution?

c. Curricular content includes Attitudes, Skills and Knowledge. These domains are expected to include basic, clinical, social and behavioral sciences. Key questions are: Who is responsible for determining the content and how? How much time is allocated to these sciences and its rationale? How and on which basis soft skills and other disciplines have been incorporated and how much time allocated to them? Which mechanism operates for modifying the content, when needed? How the research and student selected components (SSCs) have been addressed in curriculum?

d. Educational methods and teaching and learning techniques. The experiences can range from individuals to small groups to large ones, formal or otherwise and sited at campus, community or a healthcare facility. The learning methods may, in addition, be face-to-face, virtual or distance. Key questions are: Why and how the specific method(s) were selected? Do these methods span the whole curriculum? Do these methods have any indigenous contextualization?

e. Online teaching and assessment. Universities need to formulate and adopt a transparent policy and SOPs that reveal how it decides whether or not a course can be taught through online means. Functional, effective, and operational, Learning Management System (LMS)/ Virtual Teaching Platforms (VTP) are needed to ensure that the students are able to find all relevant information about their course. The development of online programs should be according to the HEC policies. Subject specific online teaching modalities should be used for teaching basic/clinical psychomotor skills. All Councils and bodies of the universities/ institutions should have provision for online meetings.

f. **Information technology (IT) resource system**. A robust IT infrastructure should be in place for proper delivery of online education. The university/institution must have at least two certified IT professionals with a minimum qualification of Bachelor's in computer sciences from recognized institutions who can manage the LMS/VTP. University/institution should develop and impart training to both faculty and students for online teaching and learning.

g. **Assessment policy and system** includes how the students will be assessed and how such an exercise helps their learning? What system is available to support the vulnerable students? How is the blueprint of examinations developed and standards set? What appeal system is there to address students' complaints? How feedback on assessments is provided to the stakeholders? Which mechanisms for quality assurance in assessment are in place? How are the pre-assessment processes and post-assessment analysis carried out and the relevant data used?

Assessment programs aligned with online teaching should be developed by the universities/institutions. These should include examinations, assignments, in-class activities, self-assessments, evaluations, built into the instructional design, and timely and constructive feedback.

2. Allocated Time

Four-year program of BDS, around 4800 hours, 32 to 36 weeks per year, 1100 hours per year.

3. Academic Staff

a. **Staff establishment policy:**. Considering the number, level and qualifications of academic faculty required to deliver the planned curriculum to the intended number of students. The distribution of faculty should be according to the grade and experience. Minimum number of faculty will be specified by the PMC.

b. **Staff performance and conduct:** Develop clear statement regarding the responsibilities (job description) of faculty for teaching, research, patient care and code of academic conduct. Anti-harassment policy, maternity leaves, grievance policy, etc.

c. **Continuing professional education (CPE) for staff:** Develop guidelines regarding how the institution will support and manage the academic and professional development of the faculty.

4. Students

a. Student induction policy should match with the resources and number of students' intake.

b. Student selection criteria should be in accordance with the PMC guidelines.

c. Student counseling and support. The institution should provide students with accessible and confidential academic, social, psychological and financial support services, as well as career guidance.

5. Quality Assurance

To ensure effective implementation of the curriculum, robust quality assurance mechanisms should be in place. A policy framework for quality assurance of the curriculum should be adopted by the university/institution in accordance with HEC guidelines. A Quality Assurance Cell (QAC) should be established in all the universities/institutions.

6. Governance & Administration

Effective implementation of the educational, research and quality assurance activities of the institution requires management, administration, budget allocation and accountability which should involve all stakeholders.

RECOMMENDATIONS FOR UNDERGRADUATE DENTAL EDUCATION (BDS) CURRICULUM

Following Recommendations are proposed
. **Oral Biology and Tooth Morphology** will be part of 1st Professional year not of 2nd Professional year. Tooth morphology will be given due weightage with the clinically relevant practice for example cavity preparation and root canal access.
. **Science of Dental Material** will be part of 2nd Professional year not of 1st Professional year.
. **Preclinical Operative dentistry and Preclinical Prosthodontics** will be part of the Science of Dental Materials Practical Examination in the second professional examination**.**
. Oral Medicine, Diagnosis & basic principles of Oral Radiology may be taught as a single subject.
. Preclinical training in community dentistry should be carried out in second year in skills lab, while in third year the community visit will consist of community-based clinical procedure.
. Periodontology will be taught and assessed separately from Oral Medicine.
. Pharmacology curriculum with regards to Analgesics, Antibiotics, and Local Anesthesia may be given higher TOS weightage**.**
. An integrated approach for teaching of Implantology is to be adopted. Surgical component can be covered by certified implantologist who can be either Oral Surgery or Periodontology whereas implant restoration to be covered by Prosthodontics or Operative Dentistry. University or Examining body to decide in their curriculum about which faculty is to teach this.
. **Pediatric Dentistry and Endodontics** should be taught and examined as a separate subject**.**
.Research should be included as the integral part of curriculum and should be taught from simple to complex concepts as per respective University Curriculum
.There should be Behavioral Sciences, Professionalism, Ethics, Patient safety, leadership & management, IT and communication skills curricula taught from simple to complex concepts
. Elective Courses for undergraduate dental students should be encouraged.

TOTAL TEACHING HOURS FOR UNDERGRADUATE DENTAL EDUCATION (BDS) CURRICULUM

Teaching Hours:
Teaching hours mean contact hour that is where there is a physical/ online contact between teacher and student for example lectures, practical/ clinical demonstrations, supervised clinics, supervised research projects, small group discussions, tutorials, preparatory courses, internal examination, online teaching, community visits and supervised self-directed learning and any other appropriate mode of information transfer.
Preclinical Sciences with clinical correlation = 2040
Clinical Sciences = 2360
Self-Directed Learning = 400
Grand Total: 2040+2360+400 = 4800 Hours
Major Guiding Principles
1.Total Teaching Hours at a minimum of **4800** in four years
2. Preclinical and Para clinical sciences at about 50% of the total hours
3. Teaching hours The clock time duration of all academic activities (other than end-of-year summative assessment) that are documented and reviewable/demonstrable to third-party such as timetabled on-site student activity hours, student assignment hours, student LMS learning hours, practical hours, community visit hours, elective study hours, preparatory and revision student hours (on-campus/off-campus), clinical hours, demonstration hours, formative and summative assessment hours etc), synchronous learning hours and asynchronous learning hours
4. Each institution needs to formulate its own curriculum with emphasis on loco regional requirements with a policy to provide the most updated dental knowledge to be utilized for the benefit of patients.
5.Teaching hours distribution is provided as a working guideline to achieve the required competencies with following flexibility: . Each distribution being provided with 10% margin for increase or decrease for relative emphasis on the respective subject. . Additional hours may be distributed from 400 hours of self-directed learning. . Additional hours of teaching may be utilized from the left-over unutilized hours from the total teaching hours available for the respective academic year

Please note that the breakup of teaching hours is at the discretion of individual universities. The suggested distribution is being provided as an example. It must not be taken as a prescriptive distribution of teaching hours.

DETAILS OF TOTAL TEACHING HOURS FOR UNDERGRADUATE DENTAL EDUCATION (BDS) CURRICULUM

Subject	1st year	2nd year	3rd year	Final year	Teaching Hours	Range of Teaching Hours
General Anatomy	280				280	250-350
General Physiology	280				280	250-350
Biochemistry	150				150	100-200
Oral Biology & Tooth Morphology	290				290	250-350
Pharmacology		200			200	150-250
General Pathology		200			200	150-250
Dental Materials Sciences		280			280	250-350
Oral Pathology		200			200	150-250
Pakistan Studies	25				25	22-28
Islamic Studies	25				25	22-38
Behavioural Sciences (including professionalism, ethics)	10	10			20	10-30
Research	40	50			90	50-150
Total	**1100**	**940**			**2040**	

Please note that the breakup of teaching hours is at the discretion of individual universities. The suggested distribution is being provided as an example. It must not be taken as a prescriptive distribution of teaching hours.

Subject	1st year	2nd year	3rd year	Final year	Total Teaching Hours	Range of Teaching Hours
Oral Medicine, Oral Diagnosis and Oral Radiology			150		150	100-200
Periodontology			185		185	150-250
General Surgery			150		150	100-200
General Medicine			150		150	100-200
Oral Surgery			70	250	320	300-400
Forensic Odontology assessed with OMFS			5		5	2-8
Operative Dentistry & Endodontics		70	70	200	340	300-400
Paediatric dentistry		20	30	150	200	150-250
Orthodontics				250	250	200-300
Prosthodontics		70	70	250	390	350-450
Preventive and Community Dentistry			200		200	250-250
Behavioural Sciences (including professionalism, ethics)			10		10	5-20
Research			10		10	5-20
Total		**160**	**1100**	**1100**	**2360**	

Please note that the breakup of teaching hours is at the discretion of individual universities. The suggested distribution is being provided as an example. It must not be taken as a prescriptive distribution of teaching hours.

YEAR WISE BREAKUP OF TOTAL TEACHING HOURS

Please note that the year wise break up of teaching hours is at the discretion of individual universities. The suggested distribution is being provided as an example. It must not be taken as a prescriptive distribution of teaching hours.

Teaching hours are provided as a working example only. These may be employed with a 10% flexibility for the subjects in which annual examination is required and with 5% flexibility for other subjects.

BDS First Professional year		
	Subjects	**Suggested Total hours**
1.	Anatomy	280
2.	Physiology	280
3.	Biochemistry	150
4.	Oral Biology & Tooth Morphology	290
5.	Pakistan studies/ Islamic Studies	50
6.	Behavioral Sciences including a. Professionalism b. Communication Skills c. Dental and dental Ethics	10
7.	Research	40
8.	Self Directed learning	100
	Total	**1200**

BDS Second Professional year		
	Subjects	**Suggested Total hours**
1.	General Pathology	200
2.	Pharmacology	200
3.	Oral Pathology	200
4.	Science of Dental Materials	280
5.	Preclinical/clinical Operative	70
6.	Preclinical /clinical Prosthodontics &	70
7.	Preclinical /clinical Pediatric dentistry	20
8.	Behavioral Sciences including a. Professionalism b. Communication Skills c. Dental and dental Ethics	10
9.	Research	50
10.	Self Directed learning	100
	Total	**1200**

BDS Third Professional year		
	Subjects	**Suggested Total hours**
1.	Oral Medicine, Oral Diagnosis and Oral Radiology	150
2.	Periodontology	185
3.	Preventive & Community Dentistry (Research)	200
4.	General Surgery	150
5.	General Medicine	150
6.	Preclinical /clinical Prosthodontics	70
7.	Preclinical /clinical Operative Dentistry	70
8.	Preclinical /clinical Pediatric dentistry	30

	Subjects	Suggested Total hours
9.	Preclinical Oral Surgery	70
10.	Forensic Odontology (assessed with OMFS)	5
11.	Behavioral Sciences including a. Professionalism b. Communication Skills c. dental and Dental Ethic d. Patient Safety and infection control	10
12.	Research	10
13.	Self Directed learning	100
	Total	**1200**

BDS Final Professional year		
	Subjects	**Suggested Total hours**
1.	Operative Dentistry & Endodontics	200
2.	Pediatric dentistry	150
3.	Oral Surgery	250
4.	Orthodontics	250
5.	Prosthodontics	250
6.	Self Directed learning	100
	Total	**1200**
	Grand Total	**4800**

Please note that the breakup of teaching hours is at the discretion of individual universities. The suggested distribution is being provided as an example. It must not be taken as a prescriptive distribution of teaching hours.

TRADITIONAL UNDERGRADUATE DENTAL EDUCATION (BDS) CURRICULUM

Introduction

The traditional discipline-based curriculum is still being used in some dental/dental schools across the globe, including Pakistan, some other Asian countries, and some Caribbean dental schools. It is based on the guidelines developed over a century ago. Here students are not exposed to clinical education or patients until the third year of their dental program. During the first two years of their dental education, the curriculum is completely focused on basic sciences. The first 2 years are frequently taught in a didactic, discipline-based format. The traditional curriculum tends to be a mixture of the wishes of the various participating faculties, occasionally with content bordering on the rare and distant frontiers of science, often too rare and distant to be necessary for inclusion in a curriculum design necessary for dental practice.

Mission

To provide students with the highest quality of dental education and experiential learning, to develop them into competent dentists, to groom their personality and inculcate in them a sense of responsibility, confidence, commitment and dedication towards their profession, society, and country.

Vision

Aspires to raise the status of dental education to one of the leading educational standards recognized globally for excellence in learning, research; and supporting a community of health professionals committed to public service; and enabling the students to attain their true potential in becoming competent, caring, and inquisitive members of the healthcare team

Please note that the year wise break up of teaching hours is at the discretion of individual universities. The suggested distribution is being provided as an example. It must not be taken as a prescriptive distribution of teaching hours.

BDS Year 1

SUBJECT	CONTACT HRS	INSTRUCTIONAL STRATEGY	ASSESSMENT METHODOLOGY
Anatomy	280	**Theory:** • Large group sessions (Lectures) • Demonstrations • Tutorials including g **Practical:** • Laboratory & Skill lab sessions (Phantom heads)	**Theory** • MCQs & SAQs (50% weightage of each) • Extended matching questions (EMQs) • Structured Essay questions (SEQs) • Long Answer Question • Oral Examination • Modified Essay Questions (MEQs) • Problem-based Questions (PBQs) • Best Answer Questions (BAQs) **Practical** • Discipline based practical and viva • Long & short case for clinical subjects • OSPE & OSCE
Physiology	280		
Biochemistry	150		
Oral Biology & Tooth Morphology	290		
Pakistan studies/ Islamic Studies	50		
Behavioral Sciences including Professionalism Communication Skills Dental and dental Ethics	10		
Research	40		
Self Directed Learning	100		
Total	**1200**		

BDS Year 2			
SUBJECT	**CONTACT HRS**	**INSTRUCTIONAL STRATEGY**	**ASSESSMENT METHODOLOGY**
General Pathology	200	**Theory:** • Large group sessions (Lectures) • Demonstrations • Tutorials including g **Practical:** • Laboratory & Skill lab sessions (Phantom heads)	**Theory** • MCQs & SAQs (50% weightage of each) • Extended matching questions (EMQs) • Structured Essay questions (SEQs) • Long Answer Question • Oral Examination • Modified Essay Questions (MEQs) • Problem-based Questions (PBQs) • Best Answer Questions (BAQs) **Practical** • Discipline based practical and viva • Long & short case for clinical subjects • OSPE & OSCE
Pharmacology	200		
Oral Pathology	200		
Science of Dental Materials	280		
Preclinical/clinical Operative	70		
Preclinical /clinical Prosthodontics &	70		
Preclinical /clinical Pediatric dentistry	70		
Behavioral Sciences including a. Professionalism b. Communication Skills c. Dental and dental Ethics	10		
Research	50		
Self Directed learning	100		
Total	**1200**		

BDS Year 3			
SUBJECT	**CONTACT HRS**	**INSTRUCTIONAL STRATEGY**	**ASSESSMENT METHODOLOGY**
Oral Medicine, Oral Diagnosis and Oral Radiology	150	**Theory:** • Large group sessions (Lectures) • Demonstrations • Tutorials • Small research group • Focus groups **Practical (pre-clinical and computer-based):** • Laboratory & Skill lab sessions(On Phantom heads, mannequins) • Computer-based practical (biostatistics) **Skills:** • Clinical Rotations. • Outpatient departments • Outreach Health Promotion activities / Community visits • Inpatient and integrated preventive practices (such as in pediatric dentistry) • Civic Engagement Electives (during summer breaks or during house job)	**Theory** • MCQs & SAQs (50% weightage of each) • Extended matching questions (EMQs) • Structured Essay questions (SEQs) • Long Answer Question • Oral Examination • Modified Essay Questions (MEQs) • Problem-based Questions (PBQs) • Best Answer Questions (BAQs) **Practical** • Discipline-based practical and viva • Long & short case for clinical subjects • OSPE & OSCE
Periodontology	185		
Preventive & Community Dentistry (Research)	200		
General Surgery	150		
General Medicine	150		
Preclinical /clinical Prosthodontics	70		
Preclinical /clinical Operative Dentistry	70		
Preclinical /clinical Pediatric dentistry	30		
Preclinical Oral Surgery	70		
Forensic Odontology (assessed with OMFS)	5		
Behavioral Sciences including Professionalism Communication Skills dental and Dental Ethic Patient Safety and infection control	10		
Research	10		
Self Directed learning	100		
Total	**1200**		

BDS Year 4			
SUBJECT	**CONTACT HRS**	**INSTRUCTIONAL STRATEGY**	**ASSESSMENT METHODOLOGY**
Operative Dentistry & Endodontics	200	**Theory:** • Large group sessions (Lectures) • Demonstrations • Tutorials / Small group **Practical:** • Laboratory & Skill lab sessions (Phantom heads) **Skills:** • Clinical Rotations. • Outpatient, Inpatient, (OMFS) Operation Theatre and Emergency departments • Electives	**Theory** • MCQs & SAQs (50% weightage of each) • Extended matching questions (EMQs) • Structured Essay questions (SEQs) • Long Answer Question • Oral Examination • Modified Essay Questions (MEQs) • Problem-based Questions (PBQs) • Best Answer Questions (BAQs **Practical** • Discipline-based practical and viva • Long & short case for clinical subjects • OSPE & OSCE
Pediatric dentistry	150		
Oral Surgery	250		
Orthodontics	250		
Prosthodontics	250		
Self Directed learning	100		
Total	**1200**		
Grand Total	**4800**		

PROPOSED ASSESSMENT METHODOLOGIES FOR TRADITIONAL CURRICULUM

Following Recommendations are proposed
. Midterm, Final and Annual Examination (Format should be provided)
. Clinical Clerk ship /Rotation (Assessment method and format should be provided)
. Logbooks with grading
. OSCE /OSPE/Short cases/Long cases (Format should be provided)
. Quarterly Feedback and assessment (Format should be provided)
. Assessment Blue prints for Final Years
Discipline/subject based • 20% internal assessment and 80% professional exam weightage • Internal assessment of annual professional university examination will remain the same for supplementary examination.

INTERNAL ASSESSMENT

THEORY

Sr No.	Scoring Parameter	Marks out of 10%
1.	Attendance >90% = 3; 89-80% =2; 79-70% =1; <70% = 0	3%
2.	Midterm/Pre Prof-Exam	3%
3.	Research	1%
4.	Continuous Assessment (Average Score of MCQs attempted after every learning session)	3%

PRACTICAL AND BEHAVIORAL (PROFESSIONALISM) ASSESSMENT

Sr No.	Scoring Parameter	Marks out of 10%
1.	Attendance >90% = 3; 89-80% = 2; 79-70% = 1; <70% = 0	3%
2.	Midterm/Pre Prof-Exam	2%
3.	*Continuous Assessment (Average Score of OSPEs/OSCEs attempted after every learning session)	2%
4.	Practical books/Logbooks	2%
5.	Discipline/attitude, responsibility and teamwork	1%

OSPE to be conducted at the end of each learning module and OSCE to be conducted at the end of each clinical rotation. The average of OSPEs and OSCEs will be considered as a continuous assessment.

INTEGRATED UNDERGRADUATE DENTAL EDUCATION (BDS) CURRICULUM

Introduction

Curriculum is a planned document which provides time bound schedule of educational activities aimed at achieving predefined learning outcomes. It includes need assessment, defining learning outcomes, preparation of table of specification for knowledge, skill and attitude to be taught with identification of modes of information transfer, implementation plan, assessment and program evaluation strategies to ensure continuous improvement.

An integrated curriculum is described as one that connects different areas of study by cutting across subject-matter lines and emphasizing unifying concepts. Integration focuses on making connections for students, allowing them to engage in relevant, meaningful activities that can be connected to real life. An integrated curriculum aims to connect the theory learned in the classroom, with practical, real-life knowledge and experiences. The practical and experiential learning aspect of an integrated curriculum is facilitated through service-learning.

The integration has to be multidisciplinary, interdisciplinary and Trans disciplinary. It starts from selecting achievable outcome and ends with development of a plan to measure the achievement outcomes. A good integrated Dental curriculum like any other, is community based and clearly keeps the service in mind. It relates to local norms and must be acceptable to the teachers and the students. Its contemporaneous nature denotes that it is a dynamic document, having built-in mechanisms for implementation and evaluation. In view of new knowledge being continuously added, a dental curriculum cannot survive in the absence of afore mentioned characteristics.

GUIDELINES FOR DEVELOPING AN INTEGRATED BDS CURRICULUM

All Universities running BDS program, are required to use following guidelines for the developing integrated dental curriculum, as per the minimum program outcomes (competencies) defined by PMC for a dental graduate:

.Universities willing to introduce integrated modular forms of curriculum, are encouraged to choose any level of integration by Ronal M. Harden, but it should not be less than level 'five', where the emphasis is on individual subjects/disciplines, but bringing together areas of common interest in different subjects.

. Those universities already practicing integrated modular teaching are encouraged to continue with their curriculum

. Distribution of academic curricular hours among different subjects of basic and clinical sciences will be as per PMC recommendations or these should not be less than 4800 hours

. The curriculum should have clearly defined learning outcomes for cognition (knowledge), psychomotor (skills), and affective (behavior) domains, as per the community needs.

. Curricular document should outline principles of curricular organization to clarify how different subjects will combine to promote comprehensive learning

. The core subjects may be placed in the form of modules and the basic sciences be integrated horizontally as well as vertically with the clinical sciences in the form of PBL's.

. The minimum competency in pre-clinical dental sciences during first two years is to be vertically integrated with competency on patients in the 3rd and final years.

. Life and living (Humanities) and elective rotations may be placed outside parent institution and in other hospitals be incorporated in curricular plan. Similarly, the social sciences subjects, research, practice management, and other subjects or modules as per university program outcomes, may be placed longitudinally along with core courses/modules.

. Early clinical exposure in the dental clinical departments from first year of BDS education should be included.

. Students should be exposed to clinical departmental environment, dental OPD and assess to community outreach programs from first year of their education. Minimum level of clinical experience in terms of observation and reflection may be encouraged by the first year BDS students.

. The mode of instruction should be more focused to the student-centered learning tools for information transfer and specific time be allocated for self-study.

COGNITIVE DOMAIN

. Instructional strategies employed for knowledge transfer should be student centered focusing on principles of active learning e.g., Problem-Based Learning, Case-Based Learning, Team-Based Learning). Teaching should promote group activities in the form of small group discussion, assignments to encourage teamwork, collaboration, and peer assisted learning among students.

. Self-directed learning shall have 100 dedicated hours per year during the whole BDS course. It will be used to encourage students to take responsibility of their own learning.

PSYCHOMOTOR DOMAIN

. In dentistry, special emphasis is promoted on hands on Skills' training starting from basic artwork in the dental sciences laboratories, it is further augmented in the advanced simulation phantom head labs, and ultimately on patients on chairside dental clinics. Certain competency is acquired through observation, working under supervision, and later independently performing various dental clinical procedures during clinical duty rotations in the 3rd and final year.

. Proper measures of infection control and patient safety are to be learnt during these procedures.

. Sufficient opportunities for practice, feedback and remediation should be provided to students for skill development as per the customized needs of each BDS student.

. Minimum exposure and attaining competency level of students in performing various dental procedures required for a general dental practitioner, is to be placed as a priority.

AFFECTIVE DOMAIN

. More contextual training in affective domain should get due share in the curriculum. Institutions should have dress codes, clearly conveyed rules and regulations and policies in handling misbehavior, bad conduct, and negligence. Behavior sciences will be taught using tools like role play, incident reporting and reflective exercises to produce well behaved professional

. By using technology, Institutions will maintain proper record of student's attendance, participation in academic activities, performance in term and annual assessments. This record will be used for student's appraisal.

. Students will be counselled in case of unsatisfactory performance with feedback and identification of corrective measures, and are to be motivated through some sort of mentorship programs by utilizing senior faculty members.

• A formal institution level curriculum committee be constituted for ensuring the documentation of the curriculum

ASSESSMENT

. Curriculum must have clearly outlined assessment plans in the form of low, medium, and high-stake assessments. Both formative and summative assessments should be part of curriculum. Summative assessments at the end of session in form of professional examination should include assessment of knowledge, skill and attitude in accordance to their weightage in the curriculum. Diverse tools of assessments should be used to ensure high validity and reliability of examination

. Assessment should be aligned with content taught during academic year. As assessment drives learning therefore distribution of questions should be in line with table of specification

. Transparency, security, and secrecy of examination are responsibility of examining body. Institution should have clearly documented policies to avoid leakage of paper, cheating and frauds during examination.

. All formal summative examination papers should be prepared as per scheduled assessment plan well ahead of the actual examination date. The due share of the senior and external examiners be part of the assessment. Multiple papers should be prepared for the subject to be examined and convener should decide which paper will be put up for examination.

. Each examination should be followed by post-exam analysis. Examination department will utilize this analysis for continuous improvement of their examination.

• Institutions should develop their own question bank for each subject being taught. Faculty members should regularly contribute questions throughout the academic year to this bank. Committee of subject specialists should regularly scrutinize these questions for quality before selection for examination. The examination department will use post-exam analysis for continuous improvement of the process, by seeking guidance from subject specialists

• In addition to summative assessments, the formative/internal assessments should be planned in curriculum during the year to promote learning. Results of these assessments should get proper weightage in final result. Curriculum should clearly define timing of assessments, content to be examined and assessment tools to be used for it.

• Appropriate Formative assessment through MCQ, SEQ, EMQ, OSCE/OSPE etc. should be used to assess students' progress in learning and to give corrective feedback to students that will encourage reflection among students to promote life-long reflective practices.

• An assessment committee at institution level will be encouraged to ensure the validity, reliability and feasibility of the examinations

PROGRAM EVALUATION

. As per the Institution program outcomes, there must be a curriculum evaluation committee comprising of subject specialists and medical educationists who should be entrusted with responsibility to evaluate curriculum throughout the year to determine whether curriculum has succeeded in producing professional with desired attributes. They will take regular feedbacks from all stakeholders including students, teachers and administration regarding learning activities, difficulties being faced and suggestions for improvement. They will arrange focus group discussions with teachers and students periodically to discuss issues being faced during learning. All this information will be used to modify and improve curriculum to enhance and encourage process of learning.

. Curriculum should be a regularly reviewed, revised and updated as per the latest developments in the profession

. Transparency, security, and secrecy of examination are responsibility of examining body. Institution should have clearly documented policies to avoid leakage of paper, cheating and frauds during examination.

. All formal summative examination papers should be prepared as per scheduled assessment plan well ahead of the actual examination date. The due share of the senior and external examiners be part of the assessment. Multiple papers should be prepared for the subject to be examined and convener should decide which paper will be put up for examination

. Each examination should be followed by post-exam analysis. Examination department will utilize this analysis for continuous improvement of their examination.

• Institutions should develop their own question bank for each subject being taught. Faculty members should regularly contribute questions throughout the academic year to this bank. Committee of subject specialists should regularly scrutinize these questions for quality before selection for examination. The examination department will use post-exam analysis for continuous improvement of the process, by seeking guidance from subject specialists.

• In addition to summative assessments, the formative/internal assessments should be planned in curriculum during the year to promote learning. Results of these assessments should get proper weightage in final result. Curriculum should clearly define timing of assessments, content to be examined and assessment tools to be used for it.

• Appropriate Formative assessment through MCQ, SEQ, EMQ, OSCE/OSPE etc. should be used to assess students' progress in learning and to give corrective feedback to students that will encourage reflection among students to promote life-long reflective practices.

• An assessment committee at institution level will be encouraged to ensure the validity, reliability and feasibility of the examinations.

REFERENCES

a. *Basic medical education, World Federation for Medical Education (wfme) global standards for quality improvement, 2020.*

b. Accreditation council for graduate medical education (ACGME) common program requirements for Graduate Medical Education, 2015.

c. Canadian Medical Education Directives for Specialists (CanMEDS) Physician Competency Framework, 2015.

d. Higher education commission, establishment of online academic council (OAC) to oversee the quality of online education, 2020.

INSTRUCTIONAL STRATEGIES FOR INTEGRATED BDS CURRICULUM

Teaching in integrated curriculum is based on themes which unite different disciplines by blurring their boundaries. These themes allow teachers of different disciplines to meaningfully link content of their respective disciplines to enable students to see the big picture and appreciate relevance of their learning to their future practical life.

Selection of tools for information transfer should ensure simultaneous input of different disciplines to enhance understanding and implementation of knowledge being taught. Different disciplines may need to have joint teaching sessions to help students in developing links between information coming from different subjects. While tools and methods mentioned in the traditional curricula above may continue to be used, the following tools are commonly used for module or theme-based teaching:

Cognition:

- Joint or paired lectures by different disciplines
- Problem based learning sessions
- Case base learning sessions
- Group work by students
- Seminars
- Tutorials
- Videos
- Clinical-pathological conferences
- Symposiums
- Webinars
- Self-learning
- Assignments

Psychomotor training:

- Workshops
- Skill labs
- Cadaveric dissection
- Models
- Laboratory work
- Bedside teaching
- Emergency or casualty department
- Operation theatres
- Ward rounds
- Community work
- Attitude or behavior training
- Videos
- Role plays
- Role modeling
- Workshops
- Group assignments

PROPOSED ASSESSMENT METHODOLOGIES FOR INTEGRATED BDS CURRICULUM

OVERVIEW

Lack of assessment and feedback, based on observation of performance in the workplace, is one of the most serious deficiencies in current medical education practice.

John Norcini and Vanessa Burch 2007

Assessing the learner is the most important and difficult task for the tutor as students may be able compensate for sub-optimal teaching, but misaligned/poor assessment of their abilities can have long-lasting effects on their personal and professional goals.

Assessment is important not only for students but also for tutors, course/syllabi organizers, and the accrediting body (affiliated university/PMC). Assessment data informs important decisions related to whether learning outcomes have been achieved to allow progression to the next level of the course. More importantly, holistic assessment determines whether the potential graduate is competent and can practice as a safe doctor.

In curricula which are theme or module based, each module needs to be followed by assessment to determine achievement of learning outcomes defined for that module. Assessment can be both summative and formative, thereby using it for grading of students as well as for providing students with feedback to enhance and improve their learning respectively. Knowledge, skills and attitude learned during the modules will need separate tools for assessment.

Integrated assessment:
Integrated curriculum must be aligned with integrated assessment policies as it is an instrumental and integral part of curricular development.

Assessment Process:
Integrated assessment requires an in-depth analysis and understanding of the process. A good starting point for this is seeking to answer important questions, the answers of which will help form the basis of these assessments.

1. Why assess the students?

The purpose of assessment has to be clear and must include assessment for learning (as a learning strategy) and assessment of learning (summative assessment) for progression, remediation or promotion.

2. Who should assess the students?

The stakeholders should include program advisors/organizers, accrediting body, affiliated university, enrolled college, tutors, other health care professionals and students themselves, as well as standardized patients.

PMC will oversee the assessment process to be implemented by medical universities in their affiliated colleges.

3. What should be assessed?

All the competencies must be assessed. The integrated curricular objectives must be aligned with the content to be assessed according to the context in which it is taught to students. The chosen assessing material will demonstrate what is valued for example knowledge of higher order thinking, clinical skills, behavior/attitudes and professionalism among other requirements.

4. How the students should be assessed?

Integrative assessment fosters a wide variety of tools which can be incorporated to assess students. The methods to be used should be:

a. Reliable and consistent
b. Valid in measuring what it is to measure
c. Feasibility according to the resources available
d. Assessment must have an impact on student learning
e. Amenable to appropriate standard setting method

5. When should the students be assessed?

The enrolled colleges can devise their own strategy of number of internal assessments to be carried out within the prescribed timelines of the affiliated universities.

The University may provide a template of the "Course, Module or Rotation Objective Assessment Map" in the assessment procedure document.

Each course will develop an examination blueprint, which will include all competencies and information on the methods, timing, and relative contribution to the final mark of all summative assessments, criteria for passing and remediation must be specified by the university.

The final assessment by universities must be within timelines by the accrediting body.

6. Where the students should be assessed?

Internal and external assessments must conduct theory examination/practical in appropriate examination venues.

ASSESSMENT TOOLS

These tools should assess higher level of cognition like understanding, application, interpretation, analysis and decision making rather than simple recall. Different disciplines will need to develop these assessments together to judge holistic comprehension and ability to practice what is learnt by student. Tools of assessment which can be used for integrated curriculum are as following.

Cognitive Domain	Psychomotor Domain	Affective Domain
1. MCQs 2. Extended matching questions (EMQs) 3. Short Answer Questions (SAQs) 4. Short Essay questions (SEQs) 5. Oral Examinations	<u>Formative assessment:</u> 1. OSPE (Objective Structured Practical Examination) 2. Mini-Clinical Evaluation Exercise (Mini-CEX) 3. Surgical DOPS (Directly Observed Procedural Skills) 4. Case Based Discussions <u>Summative Exam:</u> 1. Objective Structured Clinical Examination (OSCE) 2. Practical Examination. 3. Direct Observation of clinical skills 4. Long case 5. Short case	The following tools can assess behavior, communication skills, ethics and professionalism. 1. Interviews 2. Direct observation of communication skill and behavior 3. OSPE/OSCE 4. Portfolios 5. Reflections (only for formative assessment)

THEORY

S.No	Scoring Parameter	Marks
1.	MCQ, SAQs and OSCE/OSPE	80%
2.	Internal Assessment	20%
3	Assignments Internal Test Presentations	

Distribution Of Examination Marks (03 Examination In A Year)

Sr No.	Scoring Parameter	Marks out of 10%
1.	Exam Theory (150) and Practical (100)	250
2.	MCQs	50
3.	SAQs/SEQs (12 Question out 9 will have to attempt)	50
4.	Internal assessment theory	25
5.	Practical Exam	100
6.	Internal assessment practical	25

Allocation Of Internal Assessment Marks

PRACTICAL (OSCEs & OSPEs)

S.No	Scoring Parameter	Marks out of 10%
1.	Attendance >90% = 3; 89-80% = 2; 79-70% = 1; <70% = 0	3%
2.	Practical books/Logbooks	2%
3.	*Continuous Assessment (Average Score of OSPEs/OSCEs attempted after every learning session)	2%
4.	Mid-term/Pre-Prof Exam	2%
5.	Electives/Selective	1%

THEORY

S.No.	Scoring Parameter	Marks out of 10%
1.	Attendance >90% = 3; 89-80% = 2; 79-70% = 1; <70% = 0	3%
2.	Mid-term/Pre-Prof Exam	3%
3.	Research	1%
4.	Continuous Assessment (Average Score of MCQs attempted after every learning session)	3%

*OSPE to be conducted at the end of each learning module and OSCE to be conducted at the end of each clinical rotation. The average of OSPEs and OSCEs will be considered as continuous assessment

1. Midterm, Final and Annual Examination (Format should be provided)
2. Clinical Clerk ship /Rotation (Assessment method and format should be provided)
3. Logbooks with grading
4. OSCE /OSPE/Short cases/Long cases (Format should be provided)
5. Quarterly Feedback and assessment (Format should be provided)
6. Assessment Blue prints for Final Years

COMPETENCIES REQUIRED FROM A DENTAL SURGEON UPON GRADUATION AND BY THE END OF THE HOUSE JOB

Each competency in this section has been classified into three levels of competence expected from the dental surgeon:

Competency Level 1: Has observed/assisted and is familiar with the steps.
Competency Level 2: Can perform under supervision.
Competency Level 3: Can perform independently.

Competencies that a Dental Graduate / House Surgeon should demonstrate include, but are not limited to, the following:

A. PATIENT ASSESSMENT

NO	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
1.	Elicit, and record patient history	2	3
2.	Perform, and record intra and extra oral examination for diagnosis of problems presenting to all specialties of dentistry, including: caries, periodontal disease, malocclusion & dentofacial deformity, common oral cysts and benign lesions, oral cancer and potentially malignant lesions, odontogenic and facial infections, mucosal disorders, dentoalveolar & maxillofacial trauma, TMJ and facial pain/neurological disorders.	2	3
3.	Perform the following examinations as part of dental patient assessment: Neck, cranial nerves V and VII, TMJ and muscles of mastication, dentofacial deformity.	2	3
4.	Perform, and record results of diagnostic investigations: transillumination test, pulp vitality test (heat, cold, electrical).	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
5.	Select, and safely take the following intraoral radiographs using PNRA safety guidelines, for adults, children, and pregnant patients: periapical, bitewing, occlusal.	2	3
6.	Select, order, and interpret extra oral imaging: OPG, lateral ceph, PA jaws, occipitomental (PNS), lateral oblique views mandible, CBCT.	1	2
7.	Select, perform/obtain, and interpret diagnostic investigations: haematological (CBC, coagulation profile, HbA1c, FBG, RBG), FNA, biopsy (excisional, incisional, trephine, brush), glucometer use.	1	2

B. PROFESSIONAL & MULTIDISCIPLINARY SKILLS

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
8.	Apply ethical standards in the provision of dental care.	2	3
9.	Practice within one's scope of competence and consult with or refer to professional colleagues when indicated.	2	3
10.	Formulate a comprehensive diagnosis, treatment, and/or referral plan for the management of patients	2	3

NO	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
11.	Take and record informed consent for common procedures in dentistry.	2	3
12.	Apply appropriate interpersonal and communication skills	1	2
13.	Apply psychosocial and behavioural principles in patient-centred health care.	1	2
14.	Communicate effectively with individuals from diverse populations	1	2
15.	Provide prevention, intervention, and educational strategies	2	3
16.	Counsel patients on physiological and biochemical principles of growth and healing to promote, maintain, and restore oral soft and hard tissues, in health and disease	1	2
17.	Take extra and intra-oral clinical photographs for dental patient record		1
18.	Communicate responsibly and professionally when using media, including but not limited to television, print, advertisements, and electronic social media	1	1
19.	Communicate verbally and in writing (face to face, electronically and phone) with patients (special or aggressive, children and teenagers, geriatric, mentally challenged, visually and auditory challenged), their relatives, colleagues, dental technicians, laboratory personnel, and wider health care professionals, including referral.	1	2

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
20.	Communicate professionally with a pathologist to discuss lab and biopsy samples and results	1	2
21.	Explain diagnosis, investigation and evidence-based treatment/management plan to patient/attendant involved in decision making.	2	3
22.	Give post-procedure instructions and counsel patient on home care after common procedures in dentistry, and on the safe use of prescribed medication.	2	3
23.	Safely prescribe drugs for common dental indications, including pain and anxiety management, infectious diseases (bacterial, viral & fungal), periodontal and mucosal diseases including ulcers and Lichen Planus, dentin hypersensitivity, oral trauma & abrasions.	2	3
24.	Practice antibiotic stewardship	2	3
25.	Deliver oral hygiene instructions i.e. instruct patients in appropriate oral hygiene methods compatible with oral health.	3	3
26.	Apply counselling skills in dentistry: advice patients on lifestyle and risk factors: habit breaking, dietary, oral hygiene, oral health, caries prevention, smoking cessation, health promotion.	2	3

	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
27.	Apply principles of dispute resolution during a conflict i.e. apply principles of conflict management in all aspects of dental practice	1	1
28.	Break bad news	1	2
29.	Manage a dental practice		1
30.	Recognize and manage/refer patient abuse and/or neglect		1
31.	Identify and manage/refer substance abuse		1
32.	Demonstrate different operator positions, instrument grips, and patient positions required to perform common procedures in dentistry.	3	3

C. INFECTION CONTROL

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
33.	Demonstrate hand hygiene, respiratory etiquette, and donning and doffing of PPE for non-aerosol generating, and for aerosol generating procedures.	3	3
34.	Aseptically set up an instrument tray and equipment for a general dental procedure. Including sterile set up of handpiece and suction, and application of sterile barriers.	3	3
35.	Follow standard precautions for infection control for handling of equipment, instruments and materials during dental procedures, including: material dispensing & manipulation & transfer to dentist, curing light use, oral radiology, dental unit water lines purging and treatment, use of intra oral cameras.	3	3
36.	Disinfect impressions and prosthetic/orthodontic appliances and devices before delivery, and before sending to the laboratory	3	3
37.	Segregate and dispose contaminated waste and sharp items generated in a dental procedure.	3	3
38.	Perform dental unit disinfection after procedures, and at the start of the day.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
39.	Run, monitor and record an autoclave cycle.	2	3
40.	Remove and store sterile packs from an autoclave	2	3
41.	Demonstrate cleaning and disinfection of blood or saliva spillage	2	3
42.	Demonstrate initial management of a needle prick injury.	2	3
43.	Disinfect, wash/clean, & package contaminated dental instruments for autoclaving	2	3

D. MEDICAL & DENTAL EMERGENCIES

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
44.	Prevent, recognize, and manage dental emergencies, including: uncontrolled bleeding, abscess (local swelling/pain), cellulitis, severe dental pain from pulpal inflammation, acute periodontitis, pericoronitis, alveolar osteitis, tooth fracture, tooth avulsion/luxation, caries/defective restorations causing pain, denture/ortho appliance adjustment if impeding function/painful, acute myofascial pain dysfunction with trismus, endodontic hypochlorite accident.	1	2

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
45.	Prevent, recognize, and manage dental emergencies in a dental clinic, including impairment or loss of consciousness, chest pain, and respiratory obstruction/distress, panic/anxiety. The dentist should be competent in recording blood pressure, Pulse & Respiratory rate, basic life support (BLS, including cardiopulmonary resuscitation), blood glucose testing by glucometer.	2	3
46.	The dentist should be competent in administering oxygen therapy, giving injections (I/M, I/V, S/C), managing infusion lines, and use of automated external defibrillator.	1	2

E. PAIN & ANXIETY MANAGEMENT

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
47.	Select and safely prescribe drugs for the management of preoperative, operative and postoperative pain and anxiety.	2	3
48.	Select and safely administer the following local anaesthesia techniques for the practice of dentistry: infiltration for maxilla and mandible (including intrapulpal, intraligamentary), and the following nerve blocks: inferior alveolar, lingual, long buccal, greater palatine, & nasopalatine.	3	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
49.	Administer the following local anaesthesia techniques for the practice of dentistry: mental block, posterior superior alveolar block, Gow Gates block, Infraorbital block, VaziranoAkinosi closed mouth block.	1	1
50.	Manage potential complications of local anaesthesia	1	2
51.	Identify indications for appropriate application of inhalation and intravenous conscious sedation techniques for dental procedures	1	1

F. DISCIPLINE SPECIFIC COMPETENCIES – PERIODONTICS

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
52.	Educate patients concerning the aetiology of periodontal disease and encourage them to assume responsibility for their oral health.	2	3
53.	Perform periodontal charting and instrumentation techniques for plaque, calculus and stains removal using manual and powered instruments.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
54.	Instruct the patients on when and how to use chemical plaque control agents in periodontal disease management.	2	3
55.	Discuss the outcome of periodontal therapy and carry out any further procedures required to maintain (supportive periodontal therapy) or improve the obtained treatment outcome.	2	2
56.	Discuss local, systemic and acquired risk factors of periodontal disease with patients, discuss the role of perio-systemic inter-relationship and its influence on periodontal treatment strategies.	2	3
57.	Provide symptomatic relief to patients presenting with painful conditions such as necrotizing ulcerative conditions, periodontal abscess, food impactions, dentine hypersensitivity.	2	3
58.	Use plaque disclosing agents.	2	3
59.	Perform instrument sharpening techniques and identify worn down periodontal instruments.	2	3
60.	Perform functional crown lengthening to achieve biological harmony in direct and indirect restorations.	1	1

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
61.	Perform gingivectomy procedure and application of periodontal surgical dressing.	1	1
62.	Perform periodontal surgical therapy for periodontal pocket reduction.	1	1

G. DISCIPLINE SPECIFIC COMPETENCIES – OPERATIVE DENTISTRY, ENDODONTICS & PAEDIATRIC DENTISTRY

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
63.	Diagnose Caries Risk and formulate a Treatment Plan accordingly	2	3
64.	Select and use restorative materials based upon location, size and shape of cavity, oral environment, and occlusal load.	2	3
65.	Select and use burs and other materials for tooth preparation, finishing and polishing of restorations.	2	3
66.	Demonstrate knowledge of oral anatomy and morphology in performing intracoronal restorations	3	3
67.	Demonstrate principles of minimal invasive dentistry during tooth preparation.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
68.	Execute vital pulp therapies, and restore endodontically treated primary and permanent teeth.	2	3
69.	Perform different classes of amalgam restorations, including tooth preparation.	3	3
70.	Perform anterior and posterior direct composite/GIC restorations, including tooth preparation for preventive Resin Restoration and other cavity forms.	3	3
71.	Apply rubber dam for performing restorative and endodontic procedures.	2	3
72.	Manipulate and apply adhesives/liners/bases and restorative materials for direct restorations.	3	3
73.	Achieve static and dynamic occlusal harmony for restorations, prostheses and appliances.	2	3
74.	Select and manipulate dental cements for luting and restoration based on biological and mechanical clinical requirements.	2	3
75.	Select and use occlusal relation registration materials.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
76.	Select, manipulate, and use materials for endodontic treatment.	2	3
77.	Handle and dispose dental mercury waste.	2	3
78.	Use Stainless steel crowns for restoring deciduous teeth.	1	2
79.	Perform pulpotomy in deciduous and young permanent teeth.	2	3
80.	Perform non-surgical endodontic therapy on teeth with single canal: access opening, chemomechanical preparation, working length estimation, & obturation.	2	3
81.	Perform non-surgical endodontic therapy on teeth with multiple canals: access opening, chemomechanical preparation, working length estimation, & obturation.	2	3
82.	Perform preventive dental procedures independently: pit & fissure sealants	2	3
83.	Apply non-pharmacological behaviour management strategies on paediatric patients.	1	2

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
84.	Perform Atraumatic Restorative Treatment (ART).	2	3
85.	Deliver fluoride & non-fluoride caries preventive therapy and use of desensitizing agents for dentine hypersensitivity.	2	3

H. DISCIPLINE SPECIFIC COMPETENCIES – PROSTHODONTICS

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
86.	Apply knowledge of oral anatomy and morphology in fabrication of temporary crowns.	2	3
87.	Achieve static and dynamic occlusal harmony for restorations, prostheses and appliances.	2	3
88.	Select and manipulate dental cements for luting and restoration based on biological and mechanical clinical requirements.	2	3
89.	Select and use burs and other materials for tooth preparation, finishing and polishing of prosthesis.	2	3
90.	Perform wire bending into different shapes, and clasps used in removable partial dentures.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
91.	Select and manipulate different types of plaster of paris to: pour dental models for study, and prosthesis fabrication; mount casts/models on an articulator.	3	3
92.	Select and manipulate impression materials for recording impressions of dentate, partially dentate and edentulous jaws as well as indirect intra / extra coronal restorations.	2	3
93.	Design, prepare teeth for and deliver indirect extracoronal restorations: anterior and posterior full coverage crowns i.e. perform anterior and posterior crown preparations for full metal, porcelain fused to metal, and all ceramic crowns.	2	3
94.	Fabricate direct temporary crowns.	2	3
95.	Perform post and core buildups	1	2
96.	Design, prepare teeth for and deliver simple 3 unit bridges	1	2
97.	Design, fabricate, and deliver removable partial dentures: impressions, maxilla mandibular relationship, denture trial & insertion.	2	3
98.	Design, fabricate, and deliver conventional complete dentures: Primary and secondary impressions, post dam marking, maxillomandibular relationship, denture trial and insertion.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
99.	Produce diagnostic casts, and mount with inter-occlusal records. Perform the laboratory procedure of pouring, removal and trimming of a gypsum cast from an alginate impression.	3	3
100.	Demonstrate face bow transfer, articulation, and programming of a semi adjustable articulator.	1	2
101.	Perform segmental tooth setup for upper and lower arches, complete or partial, followed by finishing and festooning.	3	3
102.	Manage post-insertion (post-delivery) complaints of the patient using removable prostheses.	2	3
103.	Service removable prostheses when necessary i.e.: relining, rebasing, repair.	2	3
104.	Prepare an abutment for a removal cast partial denture.	1	2
105.	Identify errors in fixed and removable prosthesis delivered from the laboratory and suggest correction.	2	3
106.	Design removable cast partial, and acrylic partial and complete dentures using surveyors.	1	2

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
107.	Perform shade selection and mapping for aesthetic restorations.	2	3
108.	Select and use occlusal relation registration materials.	2	3
109.	Perform lab procedures in fabrication of partial dentures on models.	2	2
110.	Design, fabricate and deliver occlusal splints appropriate to the patient's needs	2	3
111.	Use instruments and materials for denture fabrication.	2	3
112.	Perform the clinical procedure of impression taking with alginate and elastomeric impression materials	2	3
113.	Perform the steps of occlusal rims fabrication and adjustment	2	3

I. DISCIPLINE SPECIFIC COMPETENCIES – ORAL SURGERY & ORAL MEDICINE

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
114.	Apply knowledge of primary and secondary facial spaces involved in spread of infections in the treatment of odontogenic infections	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
115.	Perform simple extraction of erupted deciduous and permanent teeth, under local anaesthesia.	2	3
116.	Perform surgical extraction of an erupted tooth and perform surgical removal of fractured or retained roots, including design and development of mucoperiosteal flaps.	1	2
117.	Give post procedure instructions and counsel patients on care after dental extractions and after minor oral surgery procedures.	2	3
118.	Manage common intra-operative and postoperative minor oral surgery complications.	2	3
119.	Perform uncomplicated pre-prosthetic procedures including implants	1	1
120.	Perform intra-oral incision and drainage for management of odontogenic abscess.	1	1
121.	Safely perform incisional biopsy for oral mucosal lesions.	1	1
122.	Place sutures: simple interrupted sutures for closure of intraoral incisions, and intra or extra-oral lacerations; figure of 8 suture over an extraction socket.	2	3

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
123.	Demonstrate reduction of TMJ dislocation.	1	2
124.	Identify sites of extra oral surgical access (incisions) to the facial skeleton and structures, based on site, skin tension / Langer's lines, and on vital anatomical structures.	1	1
125.	Use principles of bone and soft tissue physiology in treatment planning to promote oral health and healing, including epithelial migration, guided tissue regeneration, bone growth modification	1	1
126.	Identify, on models of maxilla and mandible or of the oral cavity, sites which are suitable for harvesting of soft and hard tissue grafts for reconstruction of oral tissues.	1	1
127.	Evaluate, plan, and place dental implants.	1	1
128.	Perform closed reduction for immediate management of fractures of the maxilla and mandible.	1	1
129.	Splint teeth for management of dentoalveolar trauma - using acid etch splint, arch wire technique, and figure of 8 wiring	1	2
130.	Perform wire bending for dental splinting for dentoalveolar trauma.	1	2

J. DISCIPLINE SPECIFIC COMPETENCIES – ORTHODONTICS

NO.	COMPETENCY	EXPECTED COMPETENCE LEVEL UPON GRADUATION	EXPECTED COMPETENCE LEVEL BY THE END OF HOUSE JOB
131.	Patient assessment and Cephalometric tracing	3	3
132.	Perform mixed dentition analysis on casts, and perform/measure arch length discrepancy in permanent dentition.	3	3
133.	Diagnosis and treatment planning	1	2
134.	Fabricate and insert a functional appliance	2	3
135.	Perform mixed dentition analysis on casts, and perform/measure arch length discrepancy in permanent dentition.	1	2
136.	Execute simple orthodontic treatment procedures: insert and adjust active removable appliances to move a single tooth or to correct a cross bite, insert/adjust or remove different types of removable retainers, insert, adjust or remove a wire, ligature and separator.	2	3
137.	Adjust space maintainer.	2	3
138.	Demonstrate basic wire bending skills to fabricate removable orthodontic appliances: Retainers, Adam's clasps	2	3

ROTATIONAL PLAN FOR ONE YEAR HOUSE JOB

DEPARTMENT	ROTATION
Orthodontics	02 Months
Prosthodontics	02 Months
Operative dentistry /endodontic	02 Months
Oral Surgery	02 Months
Diagnosis	01 Months
Periodontology	02 Months
Paediatric dentistry	01 Months
Total	12 Months

* If sufficient number of patients are not available then the procedures should be performed on models or typodonts & a presentation prepared, delivered & submitted.

Note:

- Posting end assessment will be preformed at the end of each posting. Clearance is mandatory and subject to passing the assessment .
- At least one research participation is recommended by the end of the year.
- Archiving and record maintaining is mandatory in all departments.
- Records are to be maintained and saved for further investigations and shared with other dental/dental institutions as required.
- The above rotation will be flexible depending on facilities available. However rotation in the first four departments listed in the table above is mandatory for at least two months ..

ANNEXURE I

NUMBER OF PROCEDURE REQUIRED OF A HOUSE OFFICER BY THE END OF HOUSEJOB/INTERSHIP/FOUNDATION YEAR

NUMBER OF PROCEDURES IN HOUSE JOB

PROCEDURE LIST ORTHODONTICS

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
1.	History taking	1	1	2
2.	Informed Consent	1	1	2
3.	Clinical examination	2	2	3
4.	Impression taking	1	1	2
5.	Orthodontic photography	3	2	2
6.	Fabrication of cast	1	2	2
7.	Fix appliance adjustment	5	5	0
8.	Removable appliance adjustment	2	2	0
9.	Cephalometric Analysis	2	2	3

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
10.	Cast Analysis	2	2	3
11.	Fabrication of Appliance	2	2	0
12.	Appliance insertion	1	2	0
13.	Bands cementation	1	2	3
14.	Bracket bonding	1	2	2
15.	Diagnosis and treatment planning	5	2	1
	Total 85	**30**	**30**	**25**

PROCEDURE LIST PROSTHODONTICS

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
1.	History taking and Clinical examination	-	-	15
2.	Alginate Impression taking	-	-	10
3.	Silicon Impression taking	04	03	02

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
4.	Posterior tooth preparation for crown	04	04	02
5.	Anterior tooth preparation for crown	04	04	01
6.	Single unit FPD	04	02	01
7.	Occlusal splint	04	02	01
8.	Maxillofacial Obturator	02	-	-
9.	Minimal preparation FPD	02	-	-
10.	Management of complete denture complaint	04	04	02
11.	Management of partial denture complaint.	04	04	02
12.	Complete process of full denture		01 (Sharing)	
13.	Crown and bridge cementation	05	05	05
14.	Case presentation	-	01	-
15.	Diagnosis and treatment planning	-	01	

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
16.	Impression for implants	02	-	-
17.	Crown/bridge removal	04	02	02
18.	Temporary crown/bridge	02	02	02
	Total 125	**45**	**35**	**45**

PROCEDURE LIST IN OPERATIVE DENTISTRY & ENDODONTICS

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
1.	History taking and informed consent			10
2.	Clinical examination			10
3.	Diagnosis and Treatment planning	2	2	
4.	Placement of dental dam	2	5	
5.	Cavity prep and restoration for amalgam	1	2	12
6.	Cavity prep and restoration for composite	2	2	12

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
7.	Complex restorations	2	2	5
8.	Post retained build ups	2	2	4
9.	Aesthetic restorations	2	3	10
10.	Non carious cervical lesions	1	2	9
11.	RCT in Single rooted teeth	1	4	9
12.	RCT in Multi rooted teeth	1	4	2
13.	Emergency treatment/ pulpotomy for painful teeth	2	1	4
14.	Application of apex locator	1	1	
	Total 125	**45**	**35**	**45**

PROCEDURE LIST ORAL SURGERY

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
1.	History taking		5	10

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
2.	Informed Consent		5	10
3.	Clinical examination		5	10
4.	Prescription writing	2	5	10
5.	Local Anaesthesia	5 (Including Advanced Block anaesthesia Techniques)	10	30
6.	Simple extractions of deciduous or permanent teeth		10	30
7.	Simple extractions with flap and stitching	5	5	4
8.	Wisdom teeth extraction that are vertically impacted	2	1	
9.	Suturing	1	1	4
10.	Simple incisional biopsies	1	1	2
11.	Pre-Prosthetic Surgery including Dental Implants.	2		
12.	Splinting of teeth for management of dentoalveolar trauma	1		

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
13.	Reduction of TMJ dislocation	1		
14.	Diagnosis and treatment planning		2	
	Total 160	**20**	**40**	**100**

PROCEDURE LIST PEDIATRIC DENTISTRY

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
1.	History taking and informed consent		04	05
2.	Clinical examination			10
3.	Radiographic diagnosis of caries (bitewing& OPG)			15
4.	Prescription writing			10
5.	Behaviour management		05	05
6.	Fluoride gel/varnish application			05
7.	Preventive resin restoration		1	05

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
8.	Composite fillings		1	05
9.	Lining application			05
10.	Diagnosis of irreversible pulpitis		2	05
11.	Vital Pulpotomy	02		02
12.	Pulpectomy		03	
13.	EPT		03	
14.	Deciduous teeth extractions			05
15.	Simple teeth extractions	02		05
16.	Space maintainer	01		
17.	Scaling			03
18	GIC Fillings			05
	Total 110	**05**	**15**	**90**

PROCEDURE LIST FOR PERIODONTOLOGY

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
1.	History taking	2	5	10
2.	Informed Consent	2	5	10
3.	Extra-oral examination	2	5	10
4.	Cross infection practices/ PPE	2	5	10
5.	Intra-oral examination	2	5	10
6.	Basic Periodontal Examination	2	5	10
7.	Diagnosis of periodontal disease, with perio-probing and charting, and treatment by manual and power-driven instruments for supra and subgingival periodontal disease.	1	1	2
8.	Supra and subgingival root surface debridement in pocked depth of less than 5mm and absence of furcation defects	2	4	10
9.	Assessment of patient radiographs	3	4	5

S.NO	PROCEDURE	COMPETENCY		
		Observe	Perform under supervision	Perform independently
10.	Management of Periodontal Emergencies (Pain)	1	1	1
11.	Comprehensive treatment plan	1	1	2
12.	Prescription writing	4	4	10
13.	Non-surgical periodontal therapy (manual & ultrasonic scaling) in pocket depth of greater than 5mm.	2	4	10
14.	Non-surgical periodontal therapy (Root surface debridement) in pocket depth of greater than 5mm.	2	1	
15.	Crown lengthening surgery.	2		
	Total 180	**30**	**50**	**100**

TOTAL PROCEDURES IN ONE YEAR HOUSE JOB TRAINING

Department	Observe	Perform under supervision	Perform independently	Total
Orthodontics	30	30	25	85
Prosthodontics	45	35	45	125
Operative dentistry	20	30	90	140
Oral surgery	20	40	100	160
Paediatric dentistry	5	15	90	110
Periodontology	30	50	100	180
Total	**150**	**200**	**450**	**800**

ANNEXURE II

UNDERGRADUATE DENTAL EDUCATION (BDS) SYLLABUS

Please note that syllabus design is at the discretion of individual universities. The following suggested syllabus is being provided as an example. It must not be taken as being prescriptive.

ANATOMY

COURSE TOPIC: GENERAL ANATOMY AND HISTOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Anatomy	Define anatomy. Compare the branches of anatomy with regard to their practical implications.
2	Terms of position and movements	Describe the location and movement of different parts of body with respect to various terms of position and movement.
3	Cell	Discuss functions of cells. Discuss cell cycle.
4	Epithelial Tissue	Compare different types of epithelia with regard to their features, functions and locations.
5	Connective Tissue	Classify the following with regard to their structures, functions and locations: - Connective tissue; - Components of connective tissue.
6	Bones	Compare various types of bone with regard to their development, shape, histological features and blood supply.
7	Cartilages	Classify cartilages with regard to their location, morphology, histology and function.
8	Joints of Body	Relate the following: 1. Structure of different types of joint with their movements 2. General features of synovial joints with their locations

S.NO	TOPIC	TOPIC OBJECTIVES
9	Muscle	Classify muscles according to their macroscopic and microscopic structures and functions.
10	Introduction to Limbs	Describe general arrangement of bones and muscles.
11	Development of Musculoskeletal system	Discuss musculoskeletal system development.
12	General organization of CVS	Discuss the organization of circulatory system.
13	Histology of blood vessels	Compare the types of blood vessels with regard to their histology.
14	Microscopy and types of microscope	Demonstrate operational steps of microscope handling.
15	Lymphatic system	Discuss the immune system.
16	Lymphoid tissue	Compare the lymphoid organs with regard to their histology and function.
17	Skin and Fascia	Discuss the structure and distribution of skin and fascia.
18	Histology of skin	Discuss the gross and histological features of skin and its appendages.

COURSE TOPIC: GENERAL EMBRYOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Embryology	Define Embryology and embryological terms. Discuss the clinical application of embryology.
2	Reproductive system	Identify parts of male and female reproductive system on _____
3	Uterine Cycle	
4	Cell division and Cell Cycle	Discuss types of cell division and their clinical importance.
5	Meiosis and Gametogenesis	Correlate the processes of meiosis and gametogenesis.
6	Fertilization and Implantation	Discuss the processes of fertilization and implantation. Discuss the following: 1. Development of fetus; 2. Role of teratogens in congenital anomalies; 3. Importance of antenatal diagnostic techniques.
7	Development up to 3 weeks	
8	Embryonic Period	
9	Fetal Period	
10	Fetal membranes and Placenta	
11	Role of Genes and Teratogens in birth defects	
12	Antenatal diagnostic techniques	

COURSE TOPIC: NEUROANATOMY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Cranial fossae	Describe features of cranial cavity.
2	Development of nervous system	List the steps of development of central nervous system.
3	Blood supply of brain and spinal cord	Discuss the clinical importance of blood supply of brain and spinal cord.
4	Meninges of the brain and spinal cord	Discuss the clinical importance of meninges of brain and spinal cord with regard to the following spaces: 1. Epidural; 2. Subdural; 3. Subarachnoid.
5	Dural venous sinuses	Describe the location and communications of dural venous sinuses. Discuss the clinical significance of dural venous sinuses.
6	Ventricular system of brain	Describe the structure of ventricular system. Correlate the structure of ventricular system with CSF disorders.
7	Brain stem	Describe the external features and attachment of cranial nerves with lesions.
8	Cerebellum	List the deep cerebellar nuclei. Describe the macroscopic features of the following structures: 1. Cerebellum; 2. Diencephalon; 3. Thalamus. Describe the general distribution of white matter. Identify the following based on pictures/ models: 1. Functional cortical areas; 2. Cranial nerve nuclei and their functional components; 3. Brain and spinal cord (on radiographs). Describe the structural and functional organization of autonomic nervous system.
9	Diencephalon	
10	Cerebrum	
11	Cranial nerves I-XII	
12	Autonomic nervous system	
13	Imaging of Brain and spinal cord	

COURSE TOPIC: HECK AND NECK

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction of head and neck structures	Discuss the clinical relevance of the structures of skull as seen on 4 normas. Relate the features of different aspects of skull with their clinical relevance.
2	The 4 normas of skull	
3	Osteology of mandible	Identify the structures associated with mandible on models.
4	The scalp	Discuss the clinical importance of the structures of scalp.
5	Face	Discuss the blood supply, nerve supply, lymphatic drainage and clinical conditions associated with muscles of facial expression.
6	Development of Face	Describe development and anomalies of face and pharyngeal apparatus. Discuss gross anatomy of orbit, eye and its contents. List the derivatives of optic cup. Discuss development of the eye.
7	Pharyngeal arches	
8	Orbital boundaries and contents	
9	Gross anatomy of eye ball	
10	Development of Eye	
11	External, middle, Internal ear	Discuss the clinical importance of the macroscopic structures of ear.
12	Development of Ear	List the derivatives of otic vesicle.
13	Temporal fossa	Identify the structures of temporal and infra temporal region based on data provided.
14	Infratemporal fossa	

S.NO	TOPIC	TOPIC OBJECTIVES
15	TMJ and Muscles of mastication	Discuss the articulation, neurovascular supply and the muscles of temporomandibular joint.
16	Nose and Paranasal sinuses	Discuss macroscopic and microscopic structures of nose and paranasal sinuses and their clinical application.
17	Nose and Paranasal sinuses	Describe development of nose and paranasal sinuses.
18	Oral cavity	Discuss the gross anatomy of oral cavity.
19	Oral cavity	Differentiate among the microscopic features of contents of oral cavity.
20	Tongue	Describe the macroscopic and microscopic features of tongue.
21	Tongue and Palate	Discuss development of oral structures. Discuss common anomalies of oral structures.
22	Development of Teeth	
23	Major salivary glands	Discuss macroscopic structures of major salivary glands and their clinical importance.
24	Salivary glands	Relate the histological differentiation of salivary glands with their function.
25	Major salivary glands	Discuss development of major salivary glands.
26	Cervical vertebra	Identify the cervical vertebrae based on data provided. Discuss the importance of cervical vertebrae as land marks.

S.NO	TOPIC	TOPIC OBJECTIVES
27	Skin, Fascia and neck muscles	Identify the macroscopic structures of the neck based on data provided.
28	Triangles of neck	Describe the boundaries of the triangles of neck and their contents.
29	Pituitary and Pineal gland	Describe the macroscopic and microscopic structures and development of pituitary and pineal glands.
30	Thyroid and Parathyroid glands	Discuss gross anatomy and clinical importance of thyroid and parathyroid glands.
31	Development of Thyroid and Parathyroid glands	Discuss development and anomalies of thyroid and parathyroid gland.
32	Pituitary gland	Describe the dual origin of pituitary gland.
33	Pharynx	Describe the division of pharynx.
34	Larynx	Discuss the macroscopic and microscopic structures of the larynx.
35	Trachea	Discuss the macroscopic and microscopic structures of trachea.
36	Cranial nerves 5,7,9,10 and12	Describe the course of cranial nerves and effects of their injury.
37	Major Vessels of neck	Identify major arteries and their main branches in neck on models and normal subjects.
38	Head and neck	Discuss lymphatic drainage of head and neck.

TOPIC: ABDOMEN AND THORAX

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to thoracic cavity	Describe the boundaries of thoracic cavity and its contents.
2	Mediastinum	Describe the boundaries and contents of mediastinum.
3	Gross and histology of thoracic part of respiratory tract	Identify the macroscopic and microscopic structures of lung based on data provided.
4	Development of respiratory system	List derivatives of lung bud.
5	Overview of Pericardium and Heart	Describe the macroscopic structures of heart and pericardium.
6	Development of CVS	List parts of primitives of heart tube and their derivatives.
7	General Histological features of GIT	Differentiate among the parts of small and large intestine on the basis of histology.
8	Development of GIT	List the derivatives of foregut, midgut and hindgut.

PHYSIOLOGY

COURSE TOPIC: FOUNDATION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Homeostasis 1	Discuss: 1. Importance of Physiology in modern medicine; 2. Basic life processes and survival needs of the body; 3. Principle of homeostasis as a central theme of Physiology; 4. Negative and positive feedback systems.
2	Homeostasis 2	
3	Body fluid compartments	Describe the body fluid compartments. Discuss the composition of body fluid compartments.
4	Cell membrane	Define cell. Discuss the importance of cell as the basic unit of life. Describe the composition of cell membrane. Discuss the structure and functions of all components of a cell.
5	Cell organelle 1	
6	Cell organelle 2	
7	Membrane transport 1	Define the following: 1. osmotic pressure; 2. tonicity; 3. bulk transport; 4. phagocytosis; 5. Pinocytosis. Discuss the types of membrane transport. Compare types of solutions with regard to their tonicity.
8	Membrane transport 2	
9	Membrane transport 3	

COURSE TOPIC: NERVE AND MUSCLE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Resting membrane potential	Discuss: 1. Distribution of ions across the plasma; 2. Resting potential and its importance. Define Nernst potential. Write the Nernst equation.
2	Structure of neuron and synapse	Describe the structure and function of different parts of neuron. Define synapse. Discuss the following types of synapse 1. Electrical synapse; 2. Chemical synapse.
3	Graded potential	Discuss graded potential.
4	Action potential	Discuss the action potential, its propagation in myelinated and non-myelinated nerve fibers. Describe the graph of action potential. Differentiate between graded and action potentials.
5	Action potential properties and propagation	
6	Structure of skeletal muscle	Describe muscle tissue and its functions. Discuss organizational levels of skeletal muscle.
7	Neuromuscular junction	Discuss the parts of neuromuscular junction (NMJ). Discuss the steps of impulse transmission through neuromuscular junction. Discuss the physiological basis of disorders of NMJ.
8	Excitation contraction coupling	Discuss muscle contraction in the skeletal muscle. Describe structure and function of sarcoplasmic reticulum and T-tubules.
9	Skeletal muscle contraction	Define power stroke. Discuss mechanism of skeletal muscle contraction and skeletal muscle relaxation at molecular level. Describe the role of ATP in muscle contraction.
10	Skeletal muscle mechanics	Define: 1. motor unit; 2. motor unit recruitment; 3. simple muscle twitch; 4. summation; 5. tetanization; 6. Fatigue. Differentiate between isotonic and isometric muscle contraction.

S.NO	TOPIC	TOPIC OBJECTIVES
11	Energetics of skeletal muscle	List the sources of energy for muscle contraction. Explain the basis of muscle fatigue. Differentiate among the types of muscle fibers on the basis of structure and function.
12	Smooth muscle	List the types of smooth muscles. Discuss the following: • Membrane and action potentials in smooth muscles; • Contractile mechanism of smooth muscles; • Nervous and hormonal control of smooth muscle contraction.
13	Smooth and skeletal muscle	Compare smooth and skeletal muscles with regard to their structure and function.

COURSE TOPIC: BLOOD

S.NO	TOPIC	TOPIC OBJECTIVES
1	Composition of blood	Describe the components of blood and their functions. Describe the functions of blood.
2	Erythropoiesis	Describe the structure and functions of erythrocytes. Draw a flow chart of RBCs production. Enumerate the sites of erythropoiesis. Discuss the humoral, maturation and nutritional factors affecting erythropoiesis.
3	Factors affecting erythropoiesis	
4	Haemoglobin	Discuss the formation, functions, fate and pathologies of hemoglobin.
5	Anaemia 1	Define the following: 1. Anemia; 2. Polycythemia. Classify anemia on the basis of: 1. Morphology; 2. Etiology. Discuss various types of polycythemia.
6	Anemia 2 and Polycythemia	
7	Blood groups	Discuss the following: 1. ABO blood types; 2. Rh blood types; 3. Mismatched blood transfusion hazards; 4. Erythroblastosis fetalis.

S.NO	TOPIC	TOPIC OBJECTIVES
8	Hemostasis 1	Define hemostasis. Discuss the events of hemostasis. List the contents and functions of platelets. Discuss the following: - Intrinsic and extrinsic coagulation pathways; - Fibrinolytic mechanism; - Factors that prevent clotting in normal vascular system; - Conditions that cause excessive bleeding in human beings.
9	Hemostasis 2	
10	Hemostasis 3	
11	White blood cells	Discuss leukopoeisis and inflammation. Differentiate among the types of white blood cells on the basis of their function and physical characteristics.
12	Immunity	Describe immunity and its types. Discuss types and functions of T lymphocytes. Discuss the structure and mechanism of action of antigen and antibody. Describe the complement system. Describe allergy and hypersensitivity reactions.
13	Antigen, antibody structure	
14	Humoral immunity	
15	Cell mediated immunity	
16	Composition of blood	Describe the components of blood and their functions. Describe the functions of blood.

COURSE TOPIC: CARDIOVASCULAR SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Structure of heart	Discuss the physiology of cardiac muscle and the importance of intercalated discs in cardiac muscle function. Compare types of muscles with regard to their structure and functions.
2	Cardiac muscle	Corelate the structure of cardiac muscle to its function.

S.NO	TOPIC	TOPIC OBJECTIVES
3	Cardiac action potential	Discuss the cardiac action potential. Compare the skeletal muscle and heart with regard to their action potentials.
4	Conduction system of heart	Discuss the electrical conduction system of heart. Discuss role of SA node in conduction system of heart.
5	Basic Electrocardiography 1	Draw electrocardiogram (ECG) of a normally functioning heart. Discuss the following: - Myocardial events; - 12 ECG leads; - Tachycardia; - Bradycardia; - Myocardial infarction/ischemia; - Atrial flutter; - Atrial fibrillation; - Heart blocks. Define the Cardiac vector and axis of heart.
6	Basic Electrocardiography 2	
7	Cardiac cycle	Discuss the cardiac cycle.
8	Cardiac cycle / Heart sounds	
9	Cardiac output	Discuss the following: - Cardiac output; - Frank-Starling law; - Nervous and chemical factors that alter heart rate, stroke volume, and cardiac output.
10	Factors affecting cardiac output	
11	Hemodynamics	Discuss the physical characteristics of circulation. Discuss the interrelationships of pressure, blood flow and resistance. Discuss vascular distensibility and functions of the arterial and venous systems.
12	Blood pressure and its regulation 1	Define: - Systolic blood pressure; - Diastolic blood pressure; - Mean arterial blood pressure; - Pulse pressure. Discuss short, intermediate and long-term regulations of blood pressure. Describe the renin angiotensin aldosterone system.
13	Blood pressure and its regulation 2	
14	Blood pressure and its regulation 3	
15	Local control of blood flow	Discuss the following: - Local control of blood flow; - Humoral control of circulation.
16	Microcirculation	Discuss the capillary system, vasomotion and fluid-filtration across capillaries.
17	Shock	Discuss the physiological causes of shock.

COURSE TOPIC: RESPIRATORY SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Respiratory passageways, alveoli	List the structures that make up the respiratory system in correct order. Discuss the functions of each structure of respiratory system. Differentiate between the conducting and respiratory zones of respiratory passages.
2	Pulmonary ventilation	Describe the roles of muscles of respiration in breathing. Discuss: - Pressure gradients; - Significance of dead space; - Boyle's law.
3	Lung volumes and capacities	Describe lung volumes and capacities in adult male.
4	Gas exchange	Discuss the relationship of partial pressure to a gas mixture. Describe partial pressures of oxygen and carbon dioxide in venous and arterial blood, alveolar air and cells. Discuss factors affecting exchange through respiratory membrane. Compare inspired and alveolar air with regard to their composition.
5	Transport of gases	Discuss the role of partial pressure in gas transport by the blood. Describe the transport of oxygen and carbon dioxide in blood.
6	Oxygen-Hb dissociation curve	Discuss the role of hemoglobin in oxygen transport. Describe the factors affecting release or binding of oxygen to hemoglobin Discuss Bohr's and Haldane effects. Interpret the oxygen hemoglobin dissociation curve graph.
7	Regulation of respiration 1	Describe the role of the four main groups of nuclei in the medulla and pons that control breathing. Discuss the factors that can influence rate and depth of breathing.
8	Regulation of respiration 2	Describe locations of chemoreceptors that monitor blood pH and gas concentrations. Discuss the role of chemoreceptors in the regulation of respiration.
9	Respiratory disorders / Hypoxia	Discuss the causes of these respiratory disorders: - Emphysema; - Bronchitis; - Asthma; - Pneumonia; - Pulmonary edema; - Hypoxia.

COURSE TOPIC: NEUROSCIENCE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Electrical properties of neuron	Describe the basic organization of nervous system. Discuss Electrical conduction across neuronal membrane, generation of action. Potential and transmission of nerve signal.
2	Synapse	Define synapse. List the properties of synapse. Discuss transmission of electrical signals between neurons.
3	Receptors	Describe the general characteristics of receptors. Classify receptors according to location and stimulus type. Discuss the following: - Receptor potential; - Transduction of sensory stimuli into nerve impulses.
4	Sensory pathways 1	List the different types of sensory pathways. Discuss the transmission of sensory information into CNS (DCML).
5	Sensory pathways 2	Discuss the transmission of sensory information into CNS (Anterolateral system).
6	Types of pain	Discuss types of pain, their qualities and pain receptors. Discuss dual pathways for transmission of pain signals into CNS.
7	Analgesia system	Discuss analgesia system in the brain and spinal cord. Describe brain opiods system.
8	Spinal level of motor control	Discuss the organization of the spinal cord for motor functions. Describe the role of muscle spindles and golgi tendon organs in muscle control. Discuss cord reflexes.
9	Descending tracts (pyramidal)	Describe the pathway of pyramidal efferent tracts.

S.NO	TOPIC	TOPIC OBJECTIVES
10	Descending tracts (extra pyramidal)	Compare pyramidal and extra pyramidal tracts with regard to their origin, termination and function.
11	Brainstem	Describe the major functions of: - Mid brain; - Pons; - Medulla oblongata. Discuss the control of motor functions by the brain stem.
12	Cerebellum	Discuss the structure, functions, input and output connections of cerebellum. Describe various cerebellar disorders.
13	Basal ganglia	Discuss the structure, functions, pathways and related disorders of basal ganglia.
14	Limbic system	List the components of limbic system. Describe the functions of components of limbic system.
15	Autonomic nervous system (ANS)1	Discuss the general organization and activation of ANS. Discuss structure and functions of sympathetic, parasympathetic nervous system and adrenal medulla. Compare the divisions of the ANSwith regard to origin of preganglionic fibers, location of ganglia and neurotransmitter substances. Discuss the value of adrenal medullae in the function of the sympathetic nervous system.
16	Autonomic nervous system 2	
17	Autonomic nervous system 3	

COURSE TOPIC: SPECIAL SENSES and ENDOCRINOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Vision 1	Draw a labelled diagram of an eye. Describe the physiological functions of each part of the eye. Discuss refraction and refractory structures of the eye. Discuss: - Errors of refraction and their corrections; - Accommodation; - Fluid system of eye; - Anatomy of retina; - Photochemistry of vision; - Visual pathway and associated lesions; - Image formation.
2	Vision 2	
3	Hearing and equilibrium 1	Discuss physiological anatomy of ear. Describe the role of ossicles in the process of hearing. Draw the auditory pathway. Discuss conductive and perceptive deafness. Explain the role of vestibular apparatus functions in monitoring equilibrium.
4	Hearing and equilibrium 2	
5	Sense of taste	Discuss types of taste sensations and their perception on tongue. List factors affecting taste sensation. Describe location and activation of taste buds. Describe the gustatory pathway.
6	Sense of smell	Describe the location and activation of the olfactory receptors. Discuss the primary sensations of smell. Describe the olfactory pathway to brain. Define the following: - Anosmia; - Hyposmia; - Dysosmia.
7	Classification of hormones	Classify hormones. Discuss endocrine hormones. Discuss the secretion, transport, clearance and mechanism of actions of different hormones. Describe the hormone receptors and their activation. Differentiate between endocrine and exocrine glands. List the major endocrine glands and their locations.
8	Mechanism of action of hormones	
9	Hypothalamo-hypophyseal system	Describe the following structural and functional relationships of the hypothalamus-pituitary unit. Discuss the control, site of action and functions of the adenohypophysis hormones. Discuss the effects of hypo and hyper secretions of adenohypophysis hormones. Correlate the function of the neurohypophysis and the hypothalamus.

COURSE TOPIC: SPECIAL SENSES and ENDOCRINOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
10	Anterior pituitary hormones	Discuss the synthesis, secretions and effects of anterior and posterior pituitary hormones
11	Posterior pituitary hormones	
12	Thyroid hormones	Describe the formation, secretion, function and regulation of thyroid hormones. Discuss disorders of thyroid hormones
13	Pancreatic hormones	Discuss the following mode of action of insulin release. Describe the functions of insulin, glucagon, somatostatin and pancreatic polypeptide.
14	Calcium homeostasis	List the hormones that regulate the calcium and phosphate homeostasis. Discuss the functions of parathyroid hormone, vitamin D and calcitonin. Describe hypocalcemia and hypercalcemia
15	Adrenal hormones 1	Describe the site of formation, function and control of secretion of the following adrenal hormones: - Mineralocorticoids; - Glucocorticoids.
16	Adrenal hormones 2	Discuss Cushing syndrome, Cushing disease and Addison's disease.

COURSE TOPIC: DIGESTIVE and URINARY SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Digestive system – Introduction	Describe the structural and functional organization of the digestive system. Discuss the physiological anatomy of Gastro Intestinal tract. Discuss the characteristic features of GIT smooth muscle.
2	Regulation of digestive system	Discuss the neural and hormonal control of GIT - Enteric Nervous System. Describe: - role of interstitial cells of Cajal in generation of basic electrical rhythm (BER) of the GIT; - types of GIT reflexes. Correlate the role of interstitial cells of Cajal with smooth muscle contractile activity. Contrast the effects of parasympathetic and sympathetic nervous activity in modulating GI activity.
3	Salivation	Describe the composition and functions of saliva. List the factors that increase salivary secretion. Discuss the nervous regulation of salivary secretion.
4	Mastication and Swallowing	Discuss the chewing and swallowing reflex. Describe the function of lower esophageal sphincter. Discuss the mechanisms that prevent food from entering the nasal cavity and larynx during swallowing.
5	Stomach and its secretions	List the functions of stomach. Describe composition of gastric juice and their functions. Discuss the phases of gastric secretory activity, gastric emptying and its regulation.
6	Small intestine 1	Describe types of movement in small intestine. Discuss the inhibition of motility and secretion in the stomach. Discuss peristaltic rush and migrating motor complex. List structures that increase the absorptive surface area of the small intestine. Differentiate between segmentation and the migrating motor complex of the small intestine. Discuss the factors affecting the motility and secretion of food in the stomach.

S.NO	TOPIC	TOPIC OBJECTIVES
7	Small intestine 2	Discuss the glands of small intestine with regard to their secretions and functions. Describe the function of each enzyme of the intestinal brush border. Describe the absorption of each type of nutrient in the small intestine.
8	Liver	Discuss the composition, formation, conduction and functions of Bile and Bile salts. Describe the functions and emptying of gallbladder.
9	Pancreas	Describe the composition, function and role of pancreatic secretion. Discuss factors which affect the pancreatic secretion. Illustrate the phases of pancreatic secretion. Discuss the role of hormones in regulating pancreatic secretion.
10	Large intestine, defecation reflex	Describe the structure, functions and major types of movements in large intestine. Discuss the defecation reflex. Discuss functions of internal and external anal sphincters.
11	Gastrointestinal hormones	Discuss the secretion and role of following GIT hormones in digestion of food - Cholecystokinin; - Secretin; - GIP; - Gastrin; - Gastrin Releasing Peptide; - Pancreatic Polypeptide; - Somatostatin; - Vasoactive Intestinal Polypeptide; - Motilin.
12	Kidney function and Nephron	Discuss the functional anatomy of kidney. Define Nephron and its types. Sketch the structure of Nephron. Describe parts of a nephron. Discuss the functions of kidney.
13	Glomerular filtration rate (GFR)	Define GFR. State the normal range of GFR. Describe the glomerular filtration membrane and its function. Discuss the forces that promote and oppose glomerular filtration. Calculate net filtration pressure.

S.NO	TOPIC	TOPIC OBJECTIVES
14	Regulation of GFR	Discuss the significance of auto-regulation of GFR. Describe the regulation of glomerular filtration by hormones and the nervous system.
15	Tubular reabsorption	Discuss passive and active mechanism of transport for tubular reabsorption. Discuss reabsorption of fluid by peritubular capillaries. Discuss tubular reabsorption along different parts of the nephron and its regulation. Define tubular load and Tubular transport maximum (Tm).
16	Tubular secretion	Discuss the tubular secretion processes. Describe the secretion in different parts of nephron.
17	Renal concentrating, diluting mechanism	Discuss: - Osmotic gradient; - Counter Current Mechanism; - Renal mechanisms for excreting diluted urine; - Role of anti-diuretic hormone and osmo-receptors.
18	Micturition reflex	Discuss the role of bladder in accommodating a wide range of urine volume. Describe the neural reflex pathway that regulates emptying of bladder.
19	Hormones acting on kidney	Discuss the effect of following hormones on kidney: - ADH; - Aldosterone; - Angiotensin II; - ANP; - PTH.

BIOCHEMISTRY

COURSE TOPIC: BIOCHEMISTRY OF CELL

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Biochemistry	Discuss importance of Biochemistry in Dentistry.
2	Cell- Biochemical Composition and Cell Organelles.	Describe the important micro and macro molecules found in the cell. Discuss the major functions of organelles.
3	Cell Membrane	Explain the Biochemical structure and functions of cell membrane.
4	Water	Explain the biochemical structure and properties of water.
5	PH and Buffers	Define the following: - Buffers; - Acidosis; - Alkalosis. Explain the types and mechanisms of action of the following: - Buffers; - Acidosis; - Alkalosis.

COURSE TOPIC: CARBOHYDRATE CHEMISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction of Carbohydrates	Define carbohydrates. Classify carbohydrates. Discuss sources and biodental importance of carbohydrates.
2	Monosaccharides Disaccharides and Oligo saccharides	Define the following: - Monosaccharides; - Disaccharides; - Oligosaccharides.

S.NO	TOPIC	TOPIC OBJECTIVES
		Classify the following: - Monosaccharides; - Disaccharides; - Oligosaccharides. Describe isomerism in monosaccharides. Explain the biodental importance of the following: - Monosaccharides; - Disaccharides; - Oligosaccharides.
3	Polysaccharides	Define Polysaccharides. Classify polysaccharides. Explain functions of different types of polysaccharides.

COURSE TOPIC: LIPID CHEMISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction of Lipids and Lipid Peroxidation	Define lipids. Classify lipids. Discuss the functions of lipids and biodental importance of lipids.
2	Fatty Acids and Eicosanoids and Derived Lipids	Define fatty acids. Classify fatty acids. Explain the properties, functions and nutritional importance of fatty acids.
3	Compound Lipids and Cholesterol	Classify the functions and biodental properties of each type of lipid (PL, LP, GL, sphingolipid). Discuss the functions and biodental importance of each type of lipid.

COURSE TOPIC: PROTEIN CHEMISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Amino Acids	Describe the properties, functions and chemical reactions of amino acids.
2	Introduction of Protein, Protein Structure and Collagen and Elastin	Explain the structure, function and biodental importance of proteins.
3	Plasma Proteins and Immunoglobulins	Define simple proteins (plasma proteins). Classify simple proteins. Discuss biodental importance of simple proteins.

COURSE TOPIC: ENZYMES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction of Enzymes and their Mechanism of Action	Define enzymes. Classify enzymes. Explain the structure of enzymes. Discuss the mechanism of action of enzymes. Describe the MM equation.
2	Factors and Inhibitors	Discuss the factors that regulate enzyme activity.
3	Clinical Enzymology	Discuss the clinical importance of enzymes in diagnosis.

COURSE TOPIC: NUCLEOPROTEINS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Nucleotides	Define nucleoproteins. Discuss the chemical structure and significance of nucleoproteins.
2	DNA and RNA	Describe the chemical structure, properties and functions of DNA and RNA.
3	Central Dogma of Molecular Biology	Discuss the central dogma of molecular biology.

COURSE TOPIC: HEMOGLOBIN CHEMISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Heme-Structure	Discuss structure, functions and types of hemoglobin.
2	Heme-Synthesis and Porphyrias	Explain heme synthesis. Discuss disorders of heme synthesis.
3	Hemoglobinopathies	Discuss the types, biochemical defects and clinical manifestation of hemolytic. Anemia (Thalassemia, Sickle cell Anemia).
4	Heme-Degradation and Jaundice	Discuss synthesis, types and fate of bilirubin. Classify: - Jaundice; - LFTs.

COURSE TOPIC: VITAMINS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Vitamin A, E and K	Discuss the structure, functions, RDA, sources and clinical abnormalities of the following: - Vitamin A, E and K; - Vitamin D; - Vitamin C; - Vitamin B12 and folic acids; - Vitamin B1, B2, B3 and B6.
2	Vitamin D	
3	Vitamin C	
4	Vitamin B12 and Folic Acids	
5	Vitamin B1, B2, B3 and B6	

COURSE TOPIC: MINERALS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Iron	Discuss the functions, RDA, sources, transport, storage, biochemical role and clinical importance of: - Iron; - Calcium; - Phosphorous; - Fluoride; - Other minerals.
2	Calcium, Phosphorus	
3	Fluoride and Other Minerals	

COURSE TOPIC: CARBOHYDRATE METABOLISM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Digestion and Absorption of Carbohydrates	Describe the breakdown of complex dietary carbohydrates to simple sugars. Discuss the absorption of simple sugars from GIT into portal blood.
2	Glycolysis	Define glycolysis. Explain the reactions involved in glycolytic pathway. Discuss the fate of pyruvate formed from glucose.
3	TCA	Explain the reactions and the regulation of citric acid cycle.
4	Gluconeogenesis	Define gluconeogenesis. Discuss the process of gluconeogenesis.
5	Glycogen Metabolism	Describe the formation, break down and regulation of glycogen.
6	HMP	Describe purpose, importance and reactions of Hexose Monophosphate Pathway.
7	Regulation Of Blood Glucose and Diabetes Mellitus	State the range of normal blood glucose level. Discuss the clinical significance of variations in blood glucose level and metabolic derangements that occur in Diabetes Mellitus.

COURSE TOPIC: LIPID METABOLISM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Digestion and Absorption of Lipids	Describe the breakdown of complex dietary lipids into simpler forms. Discuss the absorption of simpler forms of dietary lipids from GIT.
2	Cholesterol and Lipid Transport (Lipoproteins)	Discuss the chemistry, metabolism and associated clinical disorders of lipoproteins.
3	β Oxidation	Explain the oxidation of fatty acid.
4	Ketone Bodies	Explain the synthesis and utilization of Ketone Bodies.

COURSE TOPIC: ELECTRON TRANSPORT CHAIN

S.NO	TOPIC	TOPIC OBJECTIVES
1	Electron Transport Chain	Discuss the structure and functions of Electron Transport Chain. Describe the synthesis of ATP.

COURSE TOPIC: PROTEIN METABOLISM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Digestion and Absorption of Proteins	Describe the breakdown of dietary proteins into simpler forms. Discuss the absorption of simpler forms of dietary proteins from GIT.
2	Reactions of Amino acids, Urea Cycle and NH3 Toxicity	Explain the reactions of amino acids. Describe the ammonia metabolism.
3	Phenylalanine, Tyrosine and Tryptophan Metabolism	Discuss the metabolism and inborn errors of specific amino acids.

COURSE TOPIC: NUTRITION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction of Nutrition	Discuss the biodental importance of nutrition.
2	Balanced diet, Malnutrition and Obesity	Explain the importance of balanced diet. Discuss the clinical abnormalities related to imbalanced diet.

COURSE TOPIC: ENDOCRINOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction of Hormones	Define hormones. Classify hormones. Discuss the general characteristic of different types of hormones. Explain the chemistry, mechanism of action and metabolic role of hormones released by the following structures: - Hypothalamus; - Pituitary gland; - Thyroid gland; - Adrenal glands; - Pancreas.
2	Hypothalamus, Pituitary and Thyroid	
3	Adrenal and Pancreatic Hormones	

ORAL BIOLOGY

COURSE TOPIC: INTRODUCTION TO STRUCTURES OF ORAL TISSUES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to oral biology and structure of tooth	Discuss the clinical application of oral biology. List all structures of a tooth. Identify structures of a tooth on models.
2	Introduction to supporting structure of tooth	Identify the supporting structures of a tooth on pictures/ models. Differentiate among the various supporting structures of a tooth.
3	Age changes and clinical relevance of the structure of tooth 1	Discuss the clinical relevance of the following structures: - Enamel; - Dentine; - Cementum; - Periodontal ligament. Discuss age-related changes of the following structures: - Enamel; - Dentine; - Cementum; - Periodontal ligament.

COURSE TOPIC: GENERAL EMBRYOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Germ cell Formation and Fertilization, Prenatal Development	Discuss germ cell formation, fertilization and prenatal development. Describe Induction, Competence, and Differentiation.
2	Formation of Embryo, Neural Tube and Fate of Germ Layers	Discuss: - Development of three-layered embryo; - Development of neural tube; - Fate of germ layer.

COURSE TOPIC: EMBRYOLOGY OF HEAD FACE AND ORAL CAVITY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Neural Crest Cells and Head Formation, Branchial (Pharyngeal) Arches and Primitive Mouth	List the: - Derivatives of Pharyngeal Arches; - Derivatives of pharyngeal pouches; - Types of teratogens. Explain the development of the following structures of the embryo: - Head; - Face; - Palate; - Tongue; - Skull; - Maxilla; - Mandible; - Temporomandibular joint. Differentiate between the following processes: - Intramembranous and cartilaginous ossification; - Development of maxilla and mandible. Discuss the various types of clefts of lip and palate.
2	Formation of Face and Secondary Palate	
3	Formation of Tongue	
4	Development of Skull	
5	Development of Mandible and Maxilla	
6	Development of Temporomandibular Joint	
7	Congenital Defects	

COURSE TOPIC: CYTOSKELETON, CELL JUNCTIONS, FIBROBLASTS, AND EXTRACELLULAR MATRIX

S.NO	TOPIC	TOPIC OBJECTIVES
1	Cytoskeleton, Intercellular junctions, Epithelium–connective tissue interface	Define the cytoskeleton. Differentiate among the types of the following structures of cytoskeleton: - Filaments; - Intercellular junctions.
2	Fibroblasts, Secretory Products of Fibroblasts	Discuss fibroblasts.

COURSE TOPIC: DEVELOPMENT OF THE TOOTH AND ITS SUPPORTING TISSUES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Stages of tooth development	Discuss the development of: - Primary epithelial band; - Dental lamina; - Vestibular lamina; - Hard tissues of tooth; - Root. Differentiate among/between the following: - All stages of tooth development; - Single and multi-rooted tooth development. Discuss the theories of tooth type determination.
2	Tooth Type Determination	
3	Hard Tissue Formation and Root Formation	

COURSE TOPIC: BONE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Gross Bone Histology and bone cells	Discuss the composition, histology of bone. Describe the structure and functions of bone cells.
2	Development of bone	Differentiate between endochondral and intramembranous bone formation. Discuss the histology of endochondral and intramembranous bone.

COURSE TOPIC: ENAMEL: COMPOSITION, FORMATION, AND STRUCTURE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to enamel	Describe the composition, physical properties and histological features of enamel. Differentiate among the stages of Amelogenesis. Identify the histological features of enamel.
2	Stages of Amelogenesis and Mineralization	
3	Structural, Organizational Features of Enamel	

COURSE TOPIC: DENTIN-PULP COMPLEX

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction, types, dentine formation	Describe the composition, formation and histological landmarks of dentine. Discuss the cells of dental pulp. Critically analyse theories of dentine sensitivity. Identify the following on models/ pictures: - Various types of dentine; - Histological landmarks of dentine; - Zones of dental pulp.
2	Histology of Dentin	
3	Pulp and cells of dental pulp	
4	Theories of Dentin Sensitivity	

COURSE TOPIC: PERIODONTIUM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to periodontium	Define periodontium. List the components of periodontium.
2	Cementum formation and Types of cementum	Classify cementum. Discuss the formation and biochemical composition of cementum.
3	Alveolar bone	Describe the structure of alveolar bone. Identify the histological features of alveolar bone on pictures.
4	Periodontal Ligaments	Classify the periodontal ligaments. Discuss the cells of periodontal ligament space.

COURSE TOPIC: PHYSIOLOGIC TOOTH MOVEMENT: ERUPTION AND SHEDDING

S.NO	TOPIC	TOPIC OBJECTIVES
1	Preeruptive and eruptive tooth movement	Describe the following types of tooth movements: - Preeruptive; - Posteruptive; - Abnormal; - Orthodontic. Discuss shedding of teeth.
2	Posteruptive and abnormal tooth movement	
3	Shedding of Teeth	

COURSE TOPIC: SALIVARY GLANDS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Anatomy, development and functions of salivary glands	Describe the anatomy of salivary glands. Discuss the composition of saliva. List age-related changes in salivary glands. Discuss diseases of salivary glands. Relate the composition of saliva with its functions.
2	Histology of Major and Minor Salivary Glands	
3	Clinical considerations	

COURSE TOPIC: ORAL MUCOSA

S.NO	TOPIC	TOPIC OBJECTIVES
1	Definition, Boundaries and functions of Oral Mucosa	Define oral mucosa. Describe the boundaries of oral cavity. Explain the structure of oral mucosa. Relate the structure of oral mucosa with its functions.
2	Oral mucosa, Oral Epithelium and Lamina Propria.	Classify different types of oral mucosa. Differentiate between different types of oral mucosa on the basis of histology. Describe the cells of epithelium and connective tissue.
3	Clinical variations and Age Changes in oral mucosa	Describe the clinical variations and age changes within the oral mucosa.
4	Definition, Boundaries and functions of Oral Mucosa	Define oral mucosa. Describe the boundaries of oral cavity. Explain the structure of oral mucosa. Relate the structure of oral mucosa with its functions.

COURSE TOPIC: TEMPOROMANDIBULAR JOINT

S.NO	TOPIC	TOPIC OBJECTIVES
1	Classification of Joints Anatomy and histology of temporomandibular joint	Classify joints. List examples of each type of joint. Describe the following: - Macroscopic and microscopic structure of a joint; - Muscles of temporomandibular joint; - Innervations and blood supply of temporomandibular joint. Relate the muscle attachments with movement of joint.
2	Muscles Of Mastication and Biomechanics, Innervations and Blood Supply To TMJ	

COURSE TOPIC: FACIAL GROWTH AND DEVELOPMENT

S.NO	TOPIC	TOPIC OBJECTIVES
1	Facial Types and Profiles	Discuss various facial types and profiles. Relate the facial profiles with gender and age. Describe facial growth.

COURSE TOPIC: REPAIR AND REGENERATION OF ORAL TISSUES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Wound Healing In Oral Mucosa	Discuss the various faces of bone healing in oral mucosa. Describe the bone healing act at dentinogingival junction. Discuss the repair of enamel, dentine-pulp complex and periodontium.
2	Repair of tooth and supporting structures 1	
3	Repair of tooth and supporting structures 2	

COURSE TOPIC: INTRODUCTION TO DENTAL ANATOMY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Dental Anatomy 1	Describe the following: - Clinical application of oral biology/dental anatomy; - Importance of oral biology/dental anatomy; - Primary, transitional and permanent dentition periods; - Tooth numbering systems; - Surfaces and landmarks of teeth. Identify the following on models/ pictures: - Primary, transitional and permanent dentition periods; - Teeth on the basis of various tooth notation systems on models; - Surfaces and landmarks of teeth On models.

COURSE TOPIC: DEVELOPMENT AND ERUPTION OF THE TEETH

S.NO	TOPIC	TOPIC OBJECTIVES
1	Development and Eruption of Primary and permanent teeth	Describe the pattern and age of eruption of primary and permanent teeth. Estimate the dental age of an individual.

COURSE TOPIC: THE PRIMARY (DECIDUOUS) TEETH

S.NO	TOPIC	TOPIC OBJECTIVES
1	Maxillary Central and Lateral Incisor	Identify all deciduous teeth on models. Explain the landmarks of all deciduous teeth. Describe the endodontic anatomy of all deciduous teeth.
2	Mandibular Central and Lateral Incisor	
3	Maxillary and Mandibular Canine	
4	Maxillary First and Second Molar	
5	Mandibular First and Second Molar	

COURSE TOPIC: FORENSICS, COMPARATIVE ANATOMY, GEOMETRIES, FORM AND FUNCTION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction and application of Forensic Dentistry	Define forensic dentistry. Describe the methods of identification of unidentified individuals. Discuss application of forensic dentistry.

COURSE TOPIC: OROFACIAL COMPLEX: FORM AND FUNCTION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Physiological form of teeth and Periodontium	Describe the physiological form of the teeth and periodontium.
2	Contact Areas, Interproximal Spaces	Describe contact areas, interproximal spaces and embrasures. Identify contact areas, interproximal spaces and embrasures on models/ pictures.

COURSE TOPIC: THE PERMANENT MAXILLARY INCISORS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Maxillary Central Incisor	Identify maxillary incisors on models/ pictures. Describe the landmarks and endodontic anatomy of maxillary incisors. Compare maxillary central and lateral incisors with regard to their macroscopic structure.
2	Maxillary Lateral Incisors	

COURSE TOPIC: THE PERMANENT MANDIBULAR INCISORS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Mandibular Central Incisor	Identify mandibular incisors on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth. Compare mandibular central and lateral incisors with regard to their macroscopic structure.
2	Mandibular Lateral Incisor	

COURSE TOPIC: THE PERMANENT CANINES: MAXILLARY AND MANDIBULAR

S.NO	TOPIC	TOPIC OBJECTIVES
1	Maxillary Canine	Identify canines on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth. Compare maxillary and mandibular canines with regard to their macroscopic structure.
2	Mandibular Canine	

COURSE TOPIC: THE PERMANENT MAXILLARY PREMOLARS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Maxillary First Premolar	Identify maxillary premolars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth. Compare maxillary first and second premolars with regard to their macroscopic structure.
2	Maxillary second premolar	

COURSE TOPIC: THE PERMANENT MANDIBULAR PREMOLARS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Mandibular First Premolar	Identify mandibular premolars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth. Compare mandibular first and second premolars with regard to their macroscopic structure.
2	Mandibular Second Premolar	

COURSE TOPIC: THE PERMANENT MAXILLARY MOLARS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Maxillary First Molar	Identify maxillary molars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth. Compare maxillary first, second and third molars with regard to their macroscopic structure.
2	Maxillary Second Molar	
3	Maxillary Third Molar	

COURSE TOPIC: THE PERMANENT MANDIBULAR MOLARS- FIRST, SECOND AND THIRD

S.NO	TOPIC	TOPIC OBJECTIVES
1	Mandibular First Molar	Identify mandibular molars on models/ pictures. Describe the landmarks and endodontic anatomy of these teeth. Compare mandibular first, second and third molars with regard to their macroscopic structure.
2	Mandibular Second Molar	
3	Mandibular Third Molar	

COURSE TOPIC: DENTO-OSSEOUS STRUCTURES, BLOOD VESSELS AND NERVES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Structure of Maxilla and Mandible	Describe the macroscopic structures of maxilla and mandible. Discuss the Arterial Supply andNerve Supply to the Jaws and Teeth.
2	Arterial Supply and Nerve Supply of Jaws and Teeth	

COURSE TOPIC: OCCLUSION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Basics of Primary Occlusion	Discuss occlusion in primary and permanent dentitions.
2	Basics of Permanent Occlusion	

COMMUNITY AND PREVENTIVE DENTISTRY

COURSE TOPIC: DENTAL PUBLIC HEALTH

S.NO	TOPIC	TOPIC OBJECTIVES
1	Dental Public Health	Define the following: - Health; - Public health; - Dental public health; - Ethics in dentistry; - Surveillance and its types. Describe the following: - Public health services; - Public health problems; - Planning cycle. Discuss the issues in dental public health. Compare community health work and private practice with regard to their characteristic features. List the ethical principles biodental decision making and research.

COURSE TOPIC: ORAL HEALTH PROMOTION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Health Promotion	Define oral health promotion. Describe the Ottawa charter for health promotion. List the global goals for oral health in year 2000. Discuss knowledge and attitudes about oral health. Describe principles of oral health education. Conduct dental health education sessions.
2	Oral Health Education	

COURSE TOPIC: THE DENTAL WORKFORCE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Dental Auxiliaries	Classify dental auxiliaries. Discuss the: - types of dental auxiliaries; - functions of dental auxiliaries; - Levels of supervision.

COURSE TOPIC: THE MEASUREMENT OF ORAL DISEASE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Measurement of oral disease	Discuss: - Epidemiology; - Methods of measuring oral diseases; - Types of scales used in disease measurement; - Properties of an ideal index.

COURSE TOPIC: THE DENTAL HEALTH PRACTICE: INFECTION CONTROL AND MERCURY SAFETY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Dental health practice: Infection control and mercury Safety	Discuss the Infection control guidelines described by American Dental Association (ADA), Centres For Disease Control And Prevention (CDC) and Occupational Safety and Health Administration (OSHA). Describe HIV infection and AIDS, Hepatitis B and C. Discuss Dental unit waterlines and infection control practices. Discuss public and professional perception of infectious disease. List safety and environmental issues of dental amalgam

COURSE TOPIC: RESEARCH DESIGN IN ORAL EPIDEMIOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Research Design in Oral Epidemiology	Classify study designs. Discuss: - Causality and risk; - Types of study designs; - Essential features pf a research protocol; - Bradford Hill criteria; - Use of placebo; - Examiner reliability; - Ethical considerations.

COURSE TOPIC: DENTAL CARIES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Dental Caries	Discuss the distribution and etiology of dental caries. Discuss the relation between diet and caries. Describe root and early childhood caries. List indices used to measure caries.

COURSE TOPIC: PERIODONTAL DISEASES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Dental health practice: Infection control and mercury Safety	Discuss the Infection control guidelines described by American Dental Association (ADA), Centres For Disease Control And Prevention (CDC) and Occupational Safety and Health Administration (OSHA). Describe HIV infection and AIDS, Hepatitis B and C. Discuss Dental unit waterlines and infection control practices. Discuss public and professional perception of infectious disease. List safety and environmental issues of dental amalgam

COURSE TOPIC: ORAL CANCER and OTHER CONDITIONS OF ORAL DISEASES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Oral Cancer and Other Conditions of Oral Diseases	Discuss the occurrence, distribution and risk factors of oral cancer. Discuss soft tissue lesions of the oral cavity, cleft lip and palate, malocclusion and temporomandibular joint disorders.

COURSE TOPIC: FLUORIDE: HUMAN HEALTH, CARIES PREVENTION AND DENTAL FLUOROSIS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Dental Fluorosis	Discuss the prevalence and risk factors of fluorosis. List sources and amounts of fluoride intake. Describe fluoride physiology. Explain the relation between fluoride and dental caries. Discuss fluoride toxicity. Describe early studies of fluoridated water. List indices used to measure fluorosis. Differentiate between milder forms of fluorosis and non-fluoride opacities on the basis of their characteristics.

COURSE TOPIC: PRIMARY HEALTH CARE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Primary Health Care	Define: - Health; - Disease; - Illness. Discuss: - Levels of prevention; - Iceberg phenomenon; - Characteristics, components and principles of primary health care; - Declaration of Alma Atta.

COURSE TOPIC: BIOSTATISTICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Biostatistics	Discuss: - Sampling and its types; - Measures of central tendency and dispersion; - Types of data variables. Define: - Sensitivity; - Specificity; - Positive and negative predictive values; - False positive and negative rates.

COURSE TOPIC: FISSURE SEALANTS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Fissure Sealants	Discuss uses and issues related to fissure sealants.

COURSE TOPIC: DIET AND PLAQUE CONTROL

S.NO	TOPIC	TOPIC OBJECTIVES
1	Plaque Control	Discuss: - Cariogenicity of different sugars; - Methods of plaque control; - Rationale for plaque control; - Nature of dental plaque.

COURSE TOPIC: RESTRICTING THE USE OF TOBACCO

S.NO	TOPIC	TOPIC OBJECTIVES
1	Tobacco and its restriction	Discuss the following: - Prevalence of tobacco use; - Pathological effects of tobacco; - Laws proposed to restrict tobacco use; - Role of dental professionals in restricting tobacco use.

COURSE TOPIC: - BEHAVIOURAL SCIENCES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Behavioural Sciences	Discuss various Behaviour patterns. Describe theories of behaviour change. Discuss anxiety and fear management in Dentistry.

DENTAL MATERIALS SCIENCE

COURSE TOPIC: INTRODUCTION TO DENTAL MATERIALS SCIENCE & TERMINOLOGIES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction, Selection and Evaluation of Dental Materials	Define Dental Materials Science. Identify the different materials used in dentistry. Classify Dental Materials. Report the criteria for dental material selection and evaluation in relation to the clinical problem to be addressed.

COURSE TOPIC: BIOCOMPATIBILITY, BIOMECHANICS AND BIOMATERIAL TESTING

S.NO	TOPIC	TOPIC OBJECTIVES
1	Biocompatibility and Biological Evaluation of Materials	Define: - Biocompatibility; - Post-operative sensitivity; - Hypersensitivity (Type IV). Discuss: - Toxicity-corrosion; - Influence of dental materials on biological systems; - Performance of dental materials with regard to in vitro and in vivo tests and clinical trials.
2	Biomaterials	Relate interaction of dental biomaterials (DBMs) with the biological system. Discuss: - Use of DBMs in the body; - Scaffolds in materials; - Tooth and tissue engineering. Recall different biomaterials in use.
3	Biomechanics	Discuss biomechanics of: - Dental amalgam; - Metals; - Ceramic; - Resin based materials.
4	Biomaterial testing	Discuss: - In vivo models; - In vitro models; - Three levels of testing/usage of dental biomaterials. List the names of biomaterial quality assurance and monitoring agencies. Discuss the importance of clinical tests/ randomized clinical trials (RCTs) as the gold standard in biomaterial testing.

COURSE TOPIC: PROPERTIES USED TO CHARACTERISE DENTAL MATERIALS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Physical properties of Materials	Describe the ideal properties of dental materials. Define: - Hue; - Chroma; - Value; - Metamerism; - Transparency; - Translucency; - Opalescence; - Modulus of elasticity; - Elastic/plastic strain; - Resilience; - Toughness; - Ductility; - Malleability; - Brittleness; - Hardness; - Elasticity; - Creep; - Viscoelasticity; - Percolation; - Solubility; - Erosion (tooth wear); - Corrosion; - Tarnish. Discuss: - Physical characteristics of dental materials; - Wettability and its significance; - Stress and its types; - Stress and strain relationships of different dental materials; - Tooth wear and its types; - Reaction of material under oral conditions; - Fracture of restorative materials; - Thermal properties of dental materials; - Risk/benefit analysis; - Chemical stability of materials.
2	Mechanical properties of materials	
3	Thermal properties of materials	
4	Rheological properties of materials	
5	Biological properties of materials	

S.NO	TOPIC	TOPIC OBJECTIVES
6	Chemical properties of materials	Illustrate stress and strain relationships of different dental materials Differentiate between/among the following: - Absorption, adsorption and sorption; - Adhesion and cohesion; - Mechanical and chemical adhesion; - Radioopacity and radiolucency; - Thermal conductivity and thermal diffusivity; - Creep and flow; - Chemical and electrochemical corrosion. Analyse factors affecting colour, appearance and selection of materials. Justify the choice of material according to their mechanical properties. Relate flow characteristics of dental materials with their behaviour. Contrast the different features of fluid behaviour. Discuss the various states of materials during their mixing, manipulation and oral conditions.

COURSE TOPIC: IMPRESSION MATERIALS; CLASSIFICATION AND REQUIREMENTS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Impression Materials	Classify impression materials. Describe ideal properties of impression materials. Discuss: - Impression making; - Impression materials as duplicating materials; - General requirements, manipulative variables and clinical considerations of impression materials; - Tissue management and cross infection control; - Application of impression materials; - Composition, properties, indications, contraindications of elastic impression materials. Identify the different types of impression materials used in dentistry. Justify selection of impression materials. Mix alginate impression powder and water in the recommended ratio. Record an alginate impression on a phantom head. Recall their composition and selection based on the clinical problem to be addressed.
2	Non-elastic impression materials	
3	Elastic impression materials	

COURSE TOPIC: GYPSUM PRODUCTS FOR DENTAL CASTS

S.NO	TOPIC	TOPIC OBJECTIVES
1	General Introduction and Classification of Gypsum products	Write down: - Chemical formula of dental gypsum; - Composition and setting reaction of dental plaster and dental stone. Classify gypsum according to ISO standard. Describe the requirements of dental cast materials. Discuss the setting characteristics of dental plaster and the set material. Define die and cast. List the following: - Advantages and disadvantages of gypsum; - Different types of die materials.
2	Manipulative variables and setting characteristics	Manipulate materials using the correct technique. Mix soft plaster using the recommended technique and water/powder ratio. Build a plaster slab following the allocated dimensional guidelines. Justify any visualized change in slab dimensions during and after completion of setting reaction. Demonstrate the technique of model pouring. Fabricate dental cast/model. Trim study models. Perform finishing of study models.
3	Manufacturing processes	Discuss dry and wet calcination for producing dental plaster and dental stone.

COURSE TOPIC: WAXES USED IN DENTISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Ideal requirements and classification of dental waxes	Discuss application of different dental waxes in dentistry. Describe the components of dental waxes. Discuss: - Ideal requirements for wax pattern materials; - Properties of dental waxes; - Types of waxes; - Steps of partial dental construction. Classify dental waxes according to their use and origin. Identify the different classes of Kennedy's classification on study models Analyse partial denture design on study models. Justify the use of waxes for partial denture pattern. Demonstrate the steps of wax up on given model.
2	Properties and Applications of dental waxes	

COURSE TOPIC: POLYMERS AND SEPARATING MEDIA USED IN DENTISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Synthetic Polymers	Discuss stages of polymerization. Describe structure and properties of synthetic polymers. Classify synthetic and prosthetic laboratory resins. Describe the types, composition, characteristics, clinical application, manipulation the of synthetic and prosthetic laboratory resins.
2	Denture base polymers	Discuss: - Requirement of denture base materials; - Properties of acrylic resin as a denture base material; - Composition, manipulation and processing of denture base polymers - Alternative denture base material; - Ttemporization (chairside and laboratory) in light of appropriate PMMA material-based selection and setting chemistry. Define: - Polymethylmethacrylate; - Synthetic resins; - Acrylics; - Polymer; - Monomer; - Polymerization; - Self-cured, light-cured, heat-cured. Mix monomers according to standard ratios. Identify the physical stages of PMMA polymerisation/ acrylic denture base polymerisation (cold cure). Fabricate an acrylic partial denture.
3	Denture Lining materials	Discuss: - Hard reline materials; - Tissue conditioners; - Temporary soft lining materials; - Permanent relining materials.
4	Separating media	List the different types of separating media used in dentistry. Discuss the clinical and laboratory indications and applications of separating media.

COURSE TOPIC: DENTAL CEMENTS AND THEIR APPLICATIONS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction and classification	Classify dental cements. Differentiate between temporary and final cements.
2	Manipulation and setting characteristics	Mix: - Zinc phosphate cement as a luting agent and base; - Glass ionomer cement as a luting agent; - Calcium hydroxide as a cavity lining agent.
3	Application of dental cements	Compare the types of dental cements with regard to their use as intra pulpal medicaments, bases, lining, luting and restorative materials. Discuss the requirements of dental cements for cavity lining, luting, endodontic and orthodontic purposes.

COURSE TOPIC: METALS AND ALLOYS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction; Structure and properties	Discuss: - Micro leakage; - Creep; - Galvanism; - Tarnish; - Corrosion; - Significance of cubic crystal structure and eutectic alloys; - Properties of alloys; - Crystallization process in metals; - Coring; - Homogenization; - Solid state reactions occurring in alloys. List different methods of metal shaping in dentistry. Define annealing.
2	Gold and alloys of noble metals	Discuss the following: - Types and properties of pure gold fillings and casting gold alloys; - Heat treatments. Compare the soldering and brazing materials with regard to their properties. Describe composition of pure gold fillings and casting gold alloys. Classify gold and alloys of noble metals.

S.NO	TOPIC	TOPIC OBJECTIVES
3	Base Metal Casting Alloys	Compare the different types of base metal casting alloys with regard to their properties and clinical indications.
4	Steel and Wrought Alloys	Identify the different types of wrought alloys. Discuss: - Cold Working - Annealing; - Welding; - Soldering. Correlate the properties of steel and wrought alloys with their clinical applications. Construct the following - Alphabets A, B, G, S using 0.7 mm SS wire on given outline; - Clasp for partial denture according to the standard protocol.

COURSE TOPIC: INVESTMENT MATERIALS AND CASTING

S.NO	TOPIC	TOPIC OBJECTIVES
1	Investment materials	Differentiate between different types of investment materials. Discuss the composition and physicochemical properties required to manipulate investment materials.
2	Casting	Illustrate the following: - Formation of investment mould; - Casting process/lost wax technique. Discuss casting process/lost wax technique. Correlate faults in casting with incorrect selection of materials or faulty technique.

COURSE TOPIC: CERAMICS AND PORCELAIN FUSED TO METAL

S.NO	TOPIC	TOPIC OBJECTIVES
1	Composition and Properties	Classify the major types of ceramics. Compare the major types of ceramics with regard to composition, physical and optical properties. Relate the composition and properties of ceramics to their manufacturing clinical applications and performance.
2	Preparation of porcelain and Types of Ceramic	Discuss Compaction and firing. List types of ceramic restorations. Describe the principles of preparation of ceramic restorations.
3	CAD CAM restorations	Discuss the fundamental concept behind computer aided prosthesis design.

COURSE TOPIC: DENTAL AMALGAM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction	Discuss the requirements and historical perspective of direct filling/ restorative materials. Describe the primary purpose of each component of amalgam alloy. Relate the importance of the role of mercury/alloy ratio and its influence/effect on the setting reaction and restorative procedures.
2	Setting characteristics and properties	Discuss the setting chemistry associated with amalgam production. Discuss properties of dental amalgam.
3	Clinical Handling and Manipulative variables	Discuss: - Ideology of Black's cavity design; - Cavity design and matrices with regard to properties of the material. Justify Black's cavity design as an unchallenged baseline upon which information has been added over the years. Correlate the manipulative parameters of amalgam with the properties of the final restoration.
4	Environmental Considerations - Dental Amalgam	List the hazards of incorrect handling of mercury. Discuss the importance of mercury hygiene, mercury/amalgam scrap handling and disposal at chair side.

COURSE TOPIC: DENTAL COMPOSITE RESIN BASED RESTORATIVE MATERIALS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction	Describe components and composition of dental composites. Discuss the use of resin based dental composite materials for restorative procedures. Describe historical pretext of dental composites. Classify dental composites.
2	Properties and Setting Characteristics	Discuss general properties of composites.
3	Clinical Handling and Manipulative variables	Correlate filler particle size, setting reaction and method of manufacture of dental composite resin based restorative materials with properties and behaviour of the material in situ. Discuss the use of composites in vivo. Describe new resin based restorative materials variants available in the market.

COURSE TOPIC: ADHESION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction	Illustrate the general mechanistic aspects and approaches to adhesion. Describe: - Adhesion; - Acid etching; - Conditioning; - Priming.
2	Bonding systems and Smear layer	Describe the following - Enamel and Dentin bonding agents; - Bonding systems. Define smear layer. List constituents of smear layer. Discuss the importance of smear layer as a determinant of the clinical success of dental composites.
3	Bonding at tooth-restoration interface	Describe hybridization in relation to dental composites. Discuss the dental composite adhesion to tooth structure based on the principles of micromechanical attachment.

URSE TOPIC: GLASS IONOMER RESTORATIVE MATERIALS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction	Discuss the historical importance of glass ionomer cements (GIC) as restorative cements. Correlate the constituents of GIC to its properties. Describe the composition and properties of GIC.
2	Setting Characteristics and Manipulative variables	Describe the: - Setting reaction of GIC; - Fluoride release and ion exchange; - Interaction between GIC and the external environment and tooth interface; - Dimensional stability. Relate the properties of set GIC to its clinical manipulation and performance.
3	Modified GIC restorative materials	Justify the development of resin-modified glass ionomers. Discuss the significance of modified GIC constituents, the influence on properties and the impact on the material's clinical performance. Discuss the properties, performance and clinical indications of cermets.

COURSE TOPIC: ENDODONTIC MATERIALS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction	Describe root canal treatment. List the various endodontic materials (i.e. irrigants, lubricants, intra-canal medicaments, obturating materials).
2	Irrigants and lubricants	Discus Intra-canal medicaments and filling materials; $CaOH_2$ cements, GP. Discuss clinical handling characteristics for optimal endodontic outcomes.

COURSE TOPIC: ARTIFICIAL TEETH

S.NO	TOPIC	TOPIC OBJECTIVES
1	Properties and Clinical applications	Describe the techniques for manufacturing artificial teeth. Differentiate between acrylic and porcelain teeth. List the requirements of artificial teeth. Justify selection of artificial teeth in various clinical applications. Identify the types of artificial teeth. Identify the type of wax on the teeth strip. Select the appropriate teeth for the given model for teeth set up. Demonstrate the technique for teeth set up.

COURSE TOPIC: FINISHING and POLISHING MATERIALS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction and General Concepts	Describe finishing and polishing of dental prostheses and restorative materials. Identify equipment used in finishing and polishing of dental restorations.

PHARMACOLOGY

COURSE TOPIC: INTRODUCTION TO STRUCTURES OF ORAL TISSUES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Pharmacology	Classify pharmacology. Discuss the nomenclature, sources and active principles of drugs. Describe routes of drug administration. Calculate dosage of drugs using Youngs and Clarks Formula.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Absorption of drugs	Discuss the following: - process of drug absorption; - bioavailability; - drug distribution; - drug biotransformation; - drug excretion; - mechanism of drug action; - dose response relationship; - receptors; - Adverse drug reactions.
3	Bioavailability	
4	Drug distribution, plasma protein binding	
5	Biotransformation of drugs	
6	Plasma half-life and steady state concentration of drugs	
7	Excretion of drugs	
8	Mechanism of drug action	
9	Dose response relationship	
10	Receptors	
11	Adverse drug reactions	

COURSE TOPIC: DRUGS ACTING ON GASTROINTESTINAL TRACT

S.NO	TOPIC	TOPIC OBJECTIVES
1	Drugs used to treat PUDs (Peptic Ulcer Disease)	List the drugs used to treat peptic ulcer disease (PUDs). Classify drugs used to treat PUDs. Discuss the clinical significance of drugs used to treat PUDs. Demonstrate effects of acetylcholine, epinephrine, and atropine on intestine of rabbit.
2	Anti-emetics	Classify the following: - Anti-emetics; - Laxatives; - Anti-diarrheal. Discuss mechanism of action, clinical uses, significance, adverse effects of: - Anti-emetics; - Laxatives; - Anti-diarrheal.
3	Laxatives	
4	Anti-diarrheal drugs	

COURSE TOPIC: CARDIOVASCULAR DRUGS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Diuretics	Classify the following drugs: - Diuretics; - anti-hypertensive; - anti-anginals; - drugs used to treat cardiac failure; - anti-coagulants and thrombolytic drugs; - anti-arrhythmic drugs; - Anti-hyperlipidemia drugs. Discuss mechanism of action, clinical use, significance and adverse effects of: - diuretics; - anti-hypertensive; - anti-anginal; - drugs used to treat cardiac failure; - anti-coagulants and thrombolytic drugs; - anti-arrhythmic drugs; - Anti-hyperlipidemia drugs.
2	Anti-hypertensive drugs	
3	Anti-anginal drugs	
4	Drugs used to treat Cardiac Failure	
5	Anti-coagulants and thrombolytic drugs	
6	Anti-arrhythmic drugs	
7	Anti-hyperlipidemia drugs	

COURSE TOPIC: AUTACOIDS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Autacoids Ecosonioids Histamine and Anti histamine	Classify: - Autacoids; - Eicosanoids; - Histamine; - Antihistamines. Discuss mechanism of action, clinical uses, significance and adverse effects of: - Autacoids; - Eicosanoids; - Histamine; - Antihistamines.

COURSE TOPIC: DRUGS ACTING ON AUTONOMIC NERVOUS SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to ANS Pharmacology	Classify drugs acting on the autonomic nervous system (ANS). Describe receptors of ANS. Discuss mechanism of action, clinical uses and significance and adverse effects of the following drugs: - Sympathomimetic; - Sympatholytic; - Choliomimetic; - Anti-muscarinic; - Skeletal muscle relaxants. Identify the effects of ANS drugs on rabbit eye (Atropine pilocarpine epinephrine) in the pharmacology laboratory.
2	Sympathomimetic drugs	
3	Sympatholytic drugs.	
4	Cholinomimetic drugs	
5	Anti-muscarinic drugs	
6	Skeletal muscle relaxants	

COURSE TOPIC: DRUGS ACTING ON CENTRAL NERVOUS SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Sedative-hypnotics	Classify drugs acting on the central nervous system (CNS). Discuss mechanism of action, clinical uses and significance and adverse effects of the following drugs: - sedative hypnotics; - antiepileptics; - anti-parkinsonian drugs; - general and local anesthetics; - alcohol; - drugs for migraine; - anti-psychotics; - Anti-depressants and anti-manic drugs.
2	Antiepileptics	
3	Anti-parkinsonian drugs	
4	General anesthetics	
5	Local Anesthetics	
6	Alcohol	
7	Drugs for migraine	
8	Anti-psychotics	
9	Anti-depressant and anti-manic drugs	

COURSE TOPIC: DRUGS ACTING ON ENDOCRINE SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Hypothalamic and Pituitary drugs	Classify drugs acting on the endocrine system. Discuss mechanism of action, clinical uses and significance and adverse effects of the following: - Hypothalamic and pituitary drugs; - Adrenocorticoids; - Thyroid drugs; - Insulin preparations and oral hypoglycemic agents; - Gonadal hormones (Estrogen and Antiestrogen, Progesterone and Antagonist, OCP, Testosterone and Antagonist).
2	Adrenocorticoids	
3	Thyroid drugs	
4	Insulin and oral hypoglycemic agents	
5	Gonadal hormones	

COURSE TOPIC: ANTIBIOTICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to anti-microbial therapy	Classify antibiotics. Discuss mechanism of action, clinical uses and significance, resistance and adverse effects of the following: - Cell wall synthesis inhibitors; - Protein synthesis inhibitors; - Fluoroquinolones; - Anti-tuberculous drugs; - Antiprotozoal drugs; - Anti-viral; - Anti-fungal.
2	Cell wall synthesis inhibitors	
3	Protein synthesis inhibitors	
4	Fluoroquinolones	
5	Anti-tuberculous drugs	
6	Antiprotozoal drugs	
7	Anti-viral	
8	Anti-fungal	

COURSE TOPIC: ANALGESICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	NSAIDs and Acetaminophen	Classify analgesics. Discuss mechanism of action, clinical uses, significance and adverse effects of: - NSAIDs; - Acetaminophen; - Opioid analgesics.
2	Opioid analgesics	

COURSE TOPIC: RESPIRATORY SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Drugs used for treatment of Asthma and COPD	Classify drugs acting on the respiratory system. Discuss mechanism of action, clinical uses, significance and adverse effects of: - Drugs, inhalers and nebulizers used to treat asthma and COPD; - Anti-tussives; - Anti-histamine. Write a prescription for management of asthma and COPD.
2	Anti –tussives	
	Anti-histamines	
	Advantages of inhalers and nebulizers	

GENERAL PATHOLOGY AND MICROBIOLOGY

COURSE TOPIC: CELL INJURY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to cell injury	Define cell injury. Describe causes, mechanism and pathogenesis of cell injury.
2	Cellular adaptations	Describe cellular Adaptations. Define with examples of: - Hyperplasia; - Metaplasia; - Dysplasia; - Atrophy; - Hypertrophy.
3	Process of cell injury	Describe the sequence of the ultra-structural and biochemical changes which occur in the cell in response to cell injury. Distinguish between irreversible and reversible injury.
4	Necrosis Apoptosis	Define: - Necrosis; - Apoptosis. Differentiate between types of necrosis with examples. Discuss the pathogenesis and significance of apoptosis. Differentiate between apoptosis and necrosis.
5	Intracellular accumulation	Describe various Intracellular accumulation. Differentiate between Dystrophic and metastatic calcification and its clinical significance.

COURSE TOPIC: INFLAMMATION AND WOUND HEALING

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Inflammation	Describe the role of inflammation in the defense mechanisms of the body. Differentiate between acute and chronic inflammation.
2	Acute inflammation	Describe the vascular changes and cellular events of acute inflammation. Relate vascular changes of acute inflammation to morphological and tissue effects.

S.NO	TOPIC	TOPIC OBJECTIVES
3	Chemical mediators of inflammation	List the important chemical mediators of inflammation. Describe the complement and coagulation pathways. Discuss the Archidonic Acid metabolism and its role in inflammation. Describe the mechanism for development of fever.
4	Exudate and transudate.	Differentiate between exudate and transudate. Describe the systemic effects of acute and chronic inflammation and their possible outcomes.
5	Chronic Inflammation	Describe chronic inflammation. Define granuloma. Discuss type and causes of granuloma.
6	Repair	Discuss Repair and Regeneration.
7	Wound healing	Describe wound healing by first and second intention. Describe the formation of granulation tissue.
8	Complications of wound healing	Describe the complications of wound healing.

COURSE TOPIC: DISORDERS OF FLUID and HEMODYNAMICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Edema	Define: - Edema; - Ascites; - Hydrothorax; - Anasarca. Discuss Pathophysiological features of edema with special emphasis on CHF.
2	Hemorrhage Hyperemia and congestion	Discuss: - Hemorrhage; - Hyperemia; - Congestion.
3	Thromboembolism, Embolism, Infarction	Explain the pathogenesis of Thromboembolism. Describe the types and outcomes of thromboembolism.

S.NO	TOPIC	TOPIC OBJECTIVES
4	Thrombus	Describe Thrombus, its types with examples. Discuss DIC.
5	Shock	Define Shock. Describe types of shock. Describe the pathogenesis and etiology of four major types of shock (Hypovolemic, cardiogenic, vasovagal and septic). Describe the compensatory mechanisms involved in shock.

COURSE TOPIC: NEOPLASIA

S.NO	TOPIC	TOPIC OBJECTIVES
1	Neoplasia Introduction	Define neoplasia. Classify tumors. Discuss characteristics of benign and malignant tumors. Discuss local and systemic effects and mechanism of local and distant spread of tumors.
2	Molecular basis and carcinogenic agents	Describe the molecular basis of cancer. List Carcinogenic agents including chemical, physical agents and microorganisms related to human cancer.
3	Tumor diagnosis	Discuss grading and staging system of tumors.

COURSE TOPIC: ENVIRONMENTAL PATHOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Nutritional deficiency Alcohol abuse Burns and Radiation Smoking	Discuss the following: - Nutritional deficiency; - Alcohol abuse; - Burns and Radiation; - Smoking.

COURSE TOPIC: GENETICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Mutations	Define mutations and various types.
2	Transmission pattern of single gene disorders	Enumerate various transmission pattern of single gene disorders including; - Autosomal dominant disorders; - Autosomal recessive disorders; - X inked disorders. Describe important examples of each.
3	Proteins	Enumerate: - Disorders associated with defects in structural proteins; - Disorders associated with Receptor proteins; - Disorders associated with Enzymes.

COURSE TOPIC: SYSTEMIC PATHOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Blood Disorders	Classify Anemia. List investigation to reach a diagnosis of anemia. Discuss various bleeding disorders
2	Blood Vessels Disorders	Discuss the causes, signs and symptoms of the following disorders: - Atherosclerosis; - Hypotension; - Ischemic Heart Diseases (IHD); - Rheumatic Heart Diseases (RHD); - Endocarditis; - COPD; - IBSs (Crohn's disease and Ulcerative colitis); - Peptic Ulcers (Acute and chronic gastritis); - Diabetes; - Thyroid.
3	CVS	
4	Respiratory system	
5	GIT	
6	Endocrine System	

COURSE TOPIC: GENETICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Normal host defense	Describe Specific and nonspecific defense mechanisms: - Innate and acquired immunity; - Active and passive Immunity.
2	Antigen, antibodies and complement	Discuss Antigen, antibodies and complement with their clinical significance.
3	Cell mediated and antibody mediated immunity	Differentiate between Cell mediated and antibody mediated immunity.
4	Practical applications of immunology	Describe practical applications of immunology, (Immunization)T cells and Cellular Immunity.
5	MHCs	Discuss MHC Class 1 and MHC Class 2. Discuss transplants.
6	Hypersensitivity reactions	Define Hypersensitivity reactions. Describe its various type with examples.
7	Immunodeficiency disorders	Classify immunodeficiency disorders.
8	Autoimmunity disorders	Define Autoimmunity and self-tolerance.
9	Serological testing	Discuss the basic concepts underlying serological tests - agglutination/ precipitation. Differentiate among various serological tests: - Typhi dot; - ELISA; - ICT e.g Malaria; - PCR.

COURSE TOPIC: MICROBIOLOGY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to microbiology	Classify microorganisms. Differentiate between eukaryotes and prokaryotes.
2	Morphology of bacteria	Differentiate bacteria on the basis of: - Staining; - Shapes; - Procedure; - Accessory structures.
3	Anatomy of bacterial cell wall	List essential and non-essential structures of bacterial cell wall with their function. Differentiate between gram positive and negative cell wall.
4	Physiology of bacteria	List aerobes, anaerobes, microaerophilic, carboxyphilic organism. Discuss oxygen and nutritional requirements of various types of bacteria. Describe the growth curve.
5	Classification	Classify dentally important Bacteria.
6	Genetics	List different methods of transfer of genetic material between bacterial cells
7	Normal Flora of Human	List normal flora of human body. Explain the significance of normal flora of human body.
8	Sterilization	Classify physical and chemical methods of sterilization Differentiate between disinfections and sterilization.
9	Pathogenesis	Discuss various methods and sources of transmission. Describe virulence factors including: - Capsule wall; - Enzymes; - Toxins.

S.NO	TOPIC	TOPIC OBJECTIVES
10	Laboratory diagnosis	Describe specimen collection and transport for culture (throat, swabs, blood culture). Discuss various types of staining in direct microscopy: - Simple; - Gram's; - Zeil nelson. Discuss use of unstained preparation various in Wet mount. Describe: - Culture and sensitivity testing; - Different culture media with their use; - Enrichedand selective; - SDA. Explain Anaerobic culture and cooked meat media (Thioglycolate broth and gas pack jar). List various biochemical testing methods: - Coagulase; - Catalase; - Oxidase; - TSI and Urease. Describe sensitivity testing, media use. Demonstrate use of sensitivity plates. Discuss serological tests of bacterial diseases: - Mountox test; - Widal test; - Typhidot (Typhoid). Identify cases where special microbiology (dentally important bacteria) may be needed.
11	Gram positive Cocci	Describe various bacteria: - Streptococcus; - Staphylococcus; - C. diphtheria; - Bacillus; - Listeria; - Clostridia (c. tetani and c. defficile); - Neisseria; - Enteric Rods; - E. coli and Salmonella; - Pseudomonas aeruginosa; - Vibrio Cholera; - Campylobacter Enterocolitis; - Helicobacter Gastritis, peptic ulcer; - Zoonotic organism; - Bordetella pertussis; - H.influenzea; - Mycobacterium tuberculosis; - Mycobacterium leprea List Zoonotic diseases.
12	Gram Positive Rods	
13	Anaerobes	
14	Gram negative Cocci	
15	Gram negative Rods	
16	Mycobacteria	

S.NO	TOPIC	TOPIC OBJECTIVES
17	Protozoa	Discuss protozoa: - E. histolytica; - Malaria; - Leishmania; - Giardia; - Toxoplasma; - Trichomonas.
18	Nematodes	Discuss Nematodes and Cestodes: - Hookworms; - Ascarislumbricoides; - Entrobiusvermicularis; - Tissue Nematodes (Filaria); - TeniaSolium/saginata; - E. granulosus; - D. latum.
19	Cestodes	
20	Virology: Introduction	List major groups of DNA and RNA viruses that infect humans. Discuss Replication of viruses, viral pathogenesis, and structure of viruses. List lab investigations to reach a diagnosis for a viral disease.
21	Special Virology	Discuss the following viruses: - Hepatitis; - HIV; - Dengue; - Herpes simplex type 1 and 2; - Herpes zoster virus; - Mumps virus; - Influenza virus; - Polio virus; - Rabies virus; - Measles.
22	Mycology	Diagnose the following by interpreting lab investigations: - Candida; - Dermatophytes; - Aspergillus.

PRE-CLINICAL OPERATIVE DENTISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Operative dentistry, Biologic Considerations in Operative Dentistry	- Discuss chemical composition, structure and properties of enamel, dentin, pulp, cementum and gingiva. - Discuss morphologic and histologic structure of tooth tissues with their clinical impact on restorations. - Discuss the importance of dento-gingival complex and biologic width when planning restorations.
2	Dental Caries - Etiology, Clinical features & Prevention	- Classify different types of caries based on various factors (location, spread, extent, rate and others) - Discuss the factors responsible for caries development. - Identify clinical features of different types of caries on pictures. - Discuss the various methods of caries control.
3	Isolation	- Discuss the advantages, various methods and armamentarium of isolation. - Identify all the armamentarium required for rubber dam isolation. - Perform rubber dam isolation on phantom head for anterior and posterior teeth using different techniques accurately.
4	Patient and Operator Positioning	- Discuss the importance of correct patient and operator positioning during operative procedures. - Demonstrate the correct patient and operator position on phantom heads for working on different quadrants/teeth.
5	Instruments in Operative Dentistry	- Define the terminologies pertinent to hand instruments. - Classify hand instruments. - Grasp the various hand instruments using the correct techniques. - Describe the different parts of dental bur. - Identify the different types of dental burs based on their shape. - Identify the parts of high speed and slow speed hand pieces. - Demonstrate the accurate handling of high speed and slow speed hand pieces on plastic teeth undertaking the necessary precautions
6	Sterilization and disinfection	-Differentiate among Sterilization, Disinfection and Asepsis. - Discuss the importance of sterilization and disinfection. - Discuss elements of a sterilization plan. - Describe various methods used for sterilization and methods to monitor effectiveness of sterilization.

S.NO	TOPIC	TOPIC OBJECTIVES
		- List chemicals that are used for disinfection. - Discuss techniques for sterilization and disinfection of endodontic instruments. - Explain the exposure risks in dentistry. - Discuss cross infection and the different methods of cross infection control in the dental office.
7	Matrix band	- Identify the different types of matrix bands, retainers and wedges. - Discuss the importance of using matrix bands and wedges during restoration placement. - Demonstrate the correct technique of contouring, placement and removal of commonly used matrix systems and wedges on phantom head for anterior and posterior teeth.
8	Cavity preparation	-Discuss the objectives of tooth preparation. -Differentiate between tooth preparation features for amalgam and composite restorations. -Define various tooth preparation terminologies. -Classify various types of tooth preparations. - Discuss the stages of tooth preparation. -Prepare the anterior and posterior phantom teeth following principles of cavity design
9	Lining and bases	- Discuss the rationale for using cavity liners and bases - Demonstrate correct technique of placement of different liners and bases in cavities prepared on phantom teeth.
10	Amalgam--placement, carving, polishing	- Discuss the indications of amalgam restoration. -Restore phantom teeth using amalgam following all the recommended steps
11	Composite---placement, finishing, polishing	- Discuss the indications of composite restoration. -Restore phantom teeth using composite following all the recommended steps
12	Pits And Fissure Sealants	-Discuss the indications, types and method of placement of pit and fissure sealants.
13	Glass Ionomer Cement (GIC)---placement, finishing	- Restore phantom teeth using GIC following all the recommended steps

PRE- CLINICAL PROSTHODONTICS

COURSE TOPIC: COMPLETE DENTURE (CD)

S.NO	TOPIC	TOPIC OBJECTIVES
1	Definitions	Define the following terms: - Conventional denture - Partial dentures - Immediate denture - Overdenture - Single complete denture - Implant supported CD - Stability
2	Applied anatomy and physiology of complete denture	Discuss extra- and intra-oral landmarks of prosthetic importance
3	Peripheral tissue attachment of denture bearing area	Discuss the border structures that limit the periphery of the denture in the maxilla and the mandible
4	Tongue Form	Classify tongue form according to House. Describe Selection of occlusion depending on tongue condition: - Tongue position; - Examination of floor of mouth posture; - Tongue biting.
5	Saliva	Discuss the importance of saliva in complete denture retention considering the following: - salivary flow and viscosity - dental conditions affecting the salivary flow and viscosity - xerostomia Discuss the salivary factors contributing to complete denture retention Discuss the management of edentulous patients with altered salivary flow

S.NO	TOPIC	TOPIC OBJECTIVES

6	Evaluation of patients	Discuss history-taking of edentulous patients based on the prescribed format
		
		Discuss the following examinations of edentulous patients according to the recommended method:
		- General Examination (gait, complexion and personality, cosmetic index, mental attitude of patient)
		- Extra Oral examination including facial features, facial form, facial profile, lower facial height, muscle tone, complexion, lip competency
		  - TMJ examination (including muscles of mastication, deviation, deflection, clicking/crepitation of TMJ and mouth opening)
		  - Neuromuscular examination
		- Intra Oral Examination
		  - existing teeth (number of teeth, tilting, drifting, supra-eruption, rotation, undercuts)
		  - mucosa (color, condition, thickness)
		  - tongue examination including frenum attachment
		  - saliva [consistency (normal, thick, ropy), xerostomia]
		  - occlusion (canine guided, group function, mutually protective, inter-arch space)
		  - others (midline mouth opening, occlusal stops, periodontal condition, residual alveolar ridge classification, residual roots, tooth surface loss, prosthesis, gag reflex)
		- Radiographic examination (crown to root ratio, periapical pathology, retained residual roots, thickness of mucosa, bone support and quality, root configuration of abutment teeth)
		Discuss the intra- and extra-oral soft and hard tissue conditions pertinent to edentulous patients.
		
		Discuss the treatment plan for edentulous patients requiring complete denture
		
		Justify the treatment plan for edentulous patient requiring complete denture

7	Ridge form and ridge relations	Discuss the residual ridge configuration given by Atwood Discuss the parallelism of ridges and ridge relations
8	Impression making	Discuss the objectives of impression making

S.NO	TOPIC	TOPIC OBJECTIVES
9	Occlusion	Define the basic terminologies of occlusion Describe the different types of occlusion Discuss characteristics, importance, general considerations and types of balanced occlusion Discuss advantages, disadvantages, indications, contraindications of types of occlusion Discuss labial form of occlusal rims considering the facial landmarks, fullness of upper lip, philtrum, nasolabial fold and oral commissures Construct maxillary and mandibular occlusal rims on ideal edentulous model
10	Articulators	Discuss function, types, uses, advantages and disadvantages, purpose and requirements of an articulator. Identify different types of articulators on pictures
11	Facebow	Describe facebow and its types.
12	Teeth selection and arrangement	Describe the objectives, general considerations and methods in teeth selection
13	Try-in	Discuss try-in in complete denture fabrication

COURSE TOPIC: FIXED PROSTHODONTICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to fixed prosthodontics	Define the basic terminologies pertinent to fixed prosthodontics Discuss the applied anatomy and physiology for temporomandibular joint, muscles of mastication and dentition Describe Posselt's Envelop of Motion
2	Kennedy's Classification	Identify Kennedy's Class (including modifications) on models and pictures of dentures and dentition

COURSE TOPIC: CROWN AND FIXED PARTIAL DENTURE (INDIRECT RESTORATIONS)

S.NO	TOPIC	TOPIC OBJECTIVES
1	Basics of fixed partial denture	Define the basic terminologies pertinent to fixed partial dentures Discuss the various components and types of fixed partial dentures Discuss the indications and contraindications for fixed partial dentures
2	Crown and its types	Discuss the various partial and full coverage indirect restorations Describe the principles of tooth preparation for indirect prosthesis Discuss the indications, contraindications, required clinical assessment and steps of preparation for provision of inlay and onlay. Discuss the materials, impression techniques, clinical and laboratory procedures for the fabrication of indirect prosthesis Describe the latest innovations including CAD-CAM Technology

GENERAL SURGERY

COURSE TOPIC: PRINCIPLES OF SURGERY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Physiological response to Surgical Trauma and homeostasis	Discuss the classical concepts of homeostasis and the physiochemical and biochemical changes associated with it. List: - Mediators of metabolic response to injury; - Avoidable factors that compound the metabolic response to injury. Describe changes in body composition. Describe optimal perioperative care.
2	Wound and its Repair	Describe the normal healing response. Discuss management of wound. List disorders of healing. Categorize variety of scars and their treatment.
3	Pathophysiology and Management of Shock	Discuss the pathophysiology and patterns of shock. Prioritize the sequence of resuscitation. Discuss the use of blood and blood products in shock. Describe risks of blood transfusion.
4	Investigation and treatment of Infections and Parasitic Infestations of surgical Importance	Classify Infections. List the determining factors for development of infection. Discuss the local and systemic manifestations, sign and symptoms of bacterial and parasitic infections. Describe the principles of antimicrobial treatment. Justify the choice of antibiotics and prophylaxis in various infections.
5	Hemorrhage Blood Transfusion and their implications	Define: - Hemorrhage; - Blood transfusion. Discuss the types and pathophysiology of Hemorrhage. List various blood and blood products used for transfusion. Describe the preparation of blood products and the procedure for transfusion.

S.NO	TOPIC	TOPIC OBJECTIVES
6	Management of Acutely injured and critically ill patients	Define: - Trauma; - Aspiration pneumonia; - Embolic phenomenon. Describe types of injuries. Discuss: - Primary and secondary survey; - Resuscitation. Discuss the sign and symptoms of acutely injured and critically ill patients. Diagnose acutely injured and critically ill patients based on history and clinical examination and investigations. Formulate treatment and prevention plan for acutely injured and critically ill patients.
7	Principles in management of common Skin and Soft Tissue problems	Define: - Ulcers; - Abscess; - Sinus; - Fistula; - Swelling. - Embedded foreign bodies and Minor injuries Discuss types, sign and symptoms and pathophysiology of common skin and soft tissue problems. List investigations. Diagnose common skin and soft tissue problems based on history and clinical examination and investigations. Justify management of common skin and soft tissue problem by antibiotics, surgery or a combination of both.
8	Principles of Anaesthesia	Define Anaesthesia . Classify various types of anaesthesia . Discuss the mechanism and stages of different anaesthesia . Manage patients that are scheduled for general anaesthesia including considerations for pre-operative fasting and airway assessment.
9	Nutrition of surgical patients	Discuss pre-operative and post-operative malnutrition. Describe balance of electrolytes. Evaluate the nutritional status of surgical patients. Manage the nutritional status of surgical patients.

COURSE TOPIC: dental EMERGENCIES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Polytrauma with airway difficulty and circulatory instability	Discuss initial evaluation and intervention of patients with polytrauma and airway difficulty. Discuss steps of intubation of trauma patient. Describe simple airway strategy.
2	Uncontrolled External Hemorrhage	Define Uncontrolled external hemorrhage. Discuss types of uncontrolled external hemorrhage. Describe primary and secondary survey. Manage patients with uncontrolled external hemorrhage.
3	Patient in Hypovolemic or Septicemic Shock	Define: - Hypovolemic; - Septicemic Shock. Classify hypovolemic and septicemic shock. Differentiate between hypovolemic and septicemic shock based on pathogenesis and signs and symptoms. Discuss management of hypovolemic and septicemic shock.
4	Tension Pneumothorax	Define Tension Pneumothorax. Discuss pathophysiology, signs and symptoms and treatment of Tension Pneumothorax.
5	Cardiac Tamponade	Define Cardiac Tamponade. Discuss pathophysiology, signs and symptoms and treatment of cardiac tamponade.
6	Unconscious patient due to Head Injury	Discuss signs, symptoms and management of unconscious patient due to head injury.
7	Gas Gangrene and Tetanus	Define: - Gas Gangrene; - Tetanus. Discuss types of Gas Gangrene and Tetanus. Differentiate gas gangrene and tetanus bases on sign and symptoms and treatment.
8	Burns	Discuss depth of burn, quantity of fluid to be given, techniques and pathophysiology of burn. Manage patients presenting to the department with burns.

COURSE TOPIC: HEAD AND NECK

S.NO	TOPIC	TOPIC OBJECTIVES
1	Development abnormalities of palate, lip	Discuss types and features of development abnormalities of palate and lip. Manage developmental abnormalities of palate and lip.
2	Principles of management of Head Injuries and its complications	List types of head injuries. Manage patients presenting to the hospital with head injuries. Discuss complications of patients presenting with head injuries.
3	Diseases of Salivary glands (Inflammation, Calculus, Tumors)	Describe various diseases and abnormalities of salivary glands. Discuss clinical features and management of various diseases and abnormalities of salivary glands.
4	Neck lumps including Lymphatics Thyroid, Parathyroid	Discuss clinical features, abnormalities and management of neck lumps including: - Lymphatics; - Thyroid; - Parathyroid

COURSE TOPIC: GASTROINTESTINAL TRACT:

S.NO	TOPIC	TOPIC OBJECTIVES
1	Conditions Causing Acute Abdomen	Discuss causes, clinical features and management of conditions causing acute abdomen.

COURSE TOPIC: ABDOMINAL WALL HERNIA

S.NO	TOPIC	TOPIC OBJECTIVES
1	Abdominal Wall Hernia	Discuss clinical presentation and management of patients with abdominal wall hernia.

COURSE TOPIC: LIVER

S.NO	TOPIC	TOPIC OBJECTIVES
1	Obstructive Jaundice	Discuss clinical features and management of Obstructive Jaundice.
2	Hydated cyst	Discuss clinical features management f Hydated cyst.

COURSE TOPIC: GALL BLADDER

S.NO	TOPIC	TOPIC OBJECTIVES
1	Acute and chronic Cholecystitis	Discuss types, clinical features and management of acute and chronic cholecystitis.
2	Cholelithiasis and its Complications	Discuss clinical features, management and complications of Cholelithiasis.

COURSE TOPIC: SKIN and SOFT TISSUES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Common benign and malignant skin lesions	Discuss causes, clinical features and management of common benign and malignant skin lesions.
2	Wounds / Ulcers / abscesses /Sinuses / Fistulae	Discuss clinical features and management of: - Wounds; - Ulcers; - Abscesses; - Sinuses; - Fistulae.
3	Soft Tissue Lumps	Discuss clinicalfeatures and management of Soft Tissue Lumps.

COURSE TOPIC: VASCULAR AND NERVE DISORDERS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Arterial Disorders (Aneurysm and Gangrene)	Discuss causes, clinical features and management of Aneurysm and Gangrene.
2	Varicosities	Discuss causes, clinical features and management of Varicosities.
3	Deep venous thrombosis	Discuss causes, sign and symptoms and management of Deep venous thrombosis.
4	Peripheral nerve Injuries	Discuss causes, clinical features and management of Peripheral nerve Injuries.

GENERAL MEDICINE

COURSE TOPIC: INTRODUCTION TO GENERAL MEDICINE. PRINCIPLES OF HISTORY, INVESTIGATIONS AND DIAGNOSIS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to general medicine	Discuss scope of general medicine. Identify goals of studying general medicine. Discuss the importance of a doctor and patient relation. Explain the importance of Ethics when managing patients.
2	Clinical teachings-History, examination, investigations and diagnosis	Take dental history of a patient presenting to general medicine ward/ clinic. Interpret various signs and their clinical correlation when performing a general physical examination: - Pallor; - Cyanosis; - Jaundice; - Clubbing; - Thyroid; - Lymph nodes; - Dehydration; - Edema; - Pulse, B.P Temp, R/R.

COURSE TOPIC: GI / LIVER DISEASES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Liver Diseases	Discuss the etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following GI/ Liver diseases: - GERD; - Gastritis/ Peptic Ulcer; - Gastroenteritis; - Mal Absorption; - IBS / IBD; - Hepatitis (Acute / Chronic); - CLD and Hepatocellular Carcinoma.
2	Clinical teachings-History and Examination of GI/ Liver Disease	Take a comprehensive history for a patient presenting to the general medicine clinics with complaints of GI/ Liver disease. Perform clinical examination of patient presenting to the general medicine clinics with complaints of GI/ Liver disease: - Inspection; - Palpation; - Percussion; - Auscultation.

COURSE TOPIC: CARDIOVASCULAR SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Cardiovascular Diseases	Discuss the etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following cardiovascular diseases: - Ischemic Heart Disease (Angina / MI) - CHF - Rheumatic Fever Infective Endocarditis - Hypertension - Valvular Heart Diseases (MS / MR / AS / AR) - Congenital Heart Diseases (VSD / TOF)
2	Clinical Teachings-History taking in CVS	Take a comprehensive history for a patient presenting to the general medicine clinics with complaints of cardiovascular disease pain and symptoms: - Chest pain; - Dyspnea; - Syncope.

COURSE TOPIC: RESPIRATORY SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Respiratory Diseases	Discuss the etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following cardiovascular diseases: - TB; - COPD; - Pneumonia; - Asthma; - Bronchogenic Carcinoma; - Bronchiectasis; - Pneumothorax / Pleural effusion.
2	Clinical Teachings-History taking and clinical examination in Respiratory disease	Take a comprehensive history for a patient presenting to the general medicine clinics with complaints of respiratory disease pain and symptoms: - Cough; - Chest pain; - Wheezing; - Haemoptysis. Perform clinical examination (front and back of chest) of patient presenting to the general medicine clinics with complaints of respiratory disease: - Inspection; - Palpation; - Percussion; - Auscultation. Interpret findings seen on chest x-rays for Pneumothorax/ pleural effusion.

COURSE TOPIC: RESPIRATORY SYSTEM

S.NO	TOPIC	TOPIC OBJECTIVES
1	Neurological diseases	Discuss the etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following neurological diseases: - Facial Pain / Palsy; - Headache; - Stroke; - Epilepsy; - Parkinsons'; - Meningitis.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Clinical Teachings-History taking and clinical examination in Neurological disease	Take a comprehensive history for a patient presenting to the general medicine clinics with complaints of neurological disease pain and symptoms: - Headache; - Facial pain; - Dizziness; - Coma; - Amnesia. Assess higher mental functions of patients presenting to the general medicine clinics: - Level of consciousness; - Behaviour; - Speech; - Memory. Perform examination of: - Cranial nerves; - Motor system and reflexes; - Sensory system: o Crude touch, pain and temperature; o Fine touch, pressure, vibration, joint position; o Two-point localization and two-point discrimination. - Cerebellar system.

COURSE TOPIC: KIDNEY AND URINARY TRACT

S.NO	TOPIC	TOPIC OBJECTIVES
1	Diseases of kidney and urinary tract	Discuss the etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following diseases of kidney and urinary tract: - Acute and Chronic Renal Failure; - Nephrotic and Nephritic Syndromes; - UTI; - Electrolytes Imbalances.

COURSE TOPIC: ENDOCRINE SYSTEM and NUTRITIONALS FACTORS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Diseases of endocrine system:	Discuss the etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following: - Pituitary Diseases; - Thyroid Disorders; - Para thyroid Disorders; - Adrenal Disorders; - Diabetes Mellitus; - Vitamin Deficiencies (Vit. B, C, D).

COURSE TOPIC: INFECTIOUS DISEASES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Infectious diseases	Discuss the sources, etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following Infectious diseases: - Tetanus; - Malaria; - Viral Fevers (Dengue, Chikungynea); - HIV/ Mumps; - Sepsis; - Diphtheria; - Hospital Acquired Infections (Hepatitis, Pneumonia, Candidiasis).

COURSE TOPIC: BLOOD

S.NO	TOPIC	TOPIC OBJECTIVES
1	Blood Disorders	Discuss the sources, etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following blood disorders: - Anemia; - Leukemia; - Lymphoma; - Thrombocytopenia; - Bleeding disorders/ Anti-coagulants; - Blood products and transfusions; - Shock (anaphylactic, cardiogenic, hypovolemic). Discuss the following: - Blood products and transfusion; - Anticoagulant and antithrombotic therapy; - Haematopoietic stem cell transplant.

COURSE TOPIC: RHEUMATOLOGY AND BONE DISEASE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Diseases of Joints and Bones	Discuss the sources, etiology, clinical features, types, differential diagnosis, investigations, diagnosis, management and complications of the following diseases of joints and bones: - SLE; - RA; - Sero-negative Arthropaphies; - Osteoporosis/Osteomalacia; - Sjogren's syndrome.

ORAL PATHOLOGY

COURSE TOPIC: ABNORMALITIES OF TEETH

S.NO	TOPIC	TOPIC OBJECTIVES
1	Disturbance in number and size of teeth	**Describe** the clinical and radiographic features of disturbances in number of teeth including: - Anodontia; - Hyperdontia/ Supernumerary teeth; - Hypodontia/ Oligodontia and associated syndromes; - Impaction. **Describe** the disturbances in size of teeth including: - Macrodontia; - Microdontia.
2	Disturbance in form of teeth	Discuss the alterations in shape of teeth including: - Gemination; - Fusion; - Concrescence; - Dens invaginatus; - Dens evaginatus; - Enamel pearls; - Taurodontism; - Dilaceration; - Supernumerary roots; - Attrition, Abrasion, Erosion.

S.NO	TOPIC	TOPIC OBJECTIVES
3	Disturbance in structure of teeth	Describe the etiology, types and clinical features of the following disturbances in structure of teeth: - Amelogenesis Imperfecta; - Dentinogenesis Imperfecta; - Dentine dysplasia; - Hypercementosis; - Pulp calcifications; - Internal and external resorption.
4	Discoloration of teeth	Correlate developmental syndromes with developmental disorders of teeth. Discuss the causes and clinical features of exogenous and endogenous discoloration of teeth.

COURSE TOPIC: DENTAL CARIES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Etiology of dental caries	Discuss the role of dental plaque, microorganisms, carbohydrates and other variables in development of dental caries.
2	Classification of dental caries	Classify dental caries on basis of: - Site of attack; - Rate of attack.
3	Pathology and Histopathogenesis of dental caries	Describe the course and histopathogenesis of dental caries in: - Enamel; - Dentin; - Root.

COURSE TOPIC: DISEASES OF PULP

S.NO	TOPIC	TOPIC OBJECTIVES
1	Pulpitis	Classify diseases of the pulp. Discus setiology of pulpitis. Differentiate between different types of pulpitis on the basis of clinical, histopathologic and diagnostic features.
2	Spread of infection	Describe the spread of infection, pathogenesis, clinical and diagnostic features of: - Acute and Chronic periapical periodontitis; - Periapical abscess; - Periapical granuloma; - Periapical cyst; - Osteomyelitis; - Cellulitis and Ludwig's angina.

COURSE TOPIC: SPECIFIC AND NON-SPECIFIC INFECTION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Tuberculosis and Syphilis, Actinomycosis and Pericoronitis	Discuss Clinical features, pathogenesis and histopathology of: - Tuberculosis; - Syphilis; - Actinomycosis; - Pericoronitis and impacted teeth.

COURSE TOPIC CYST OF THE JAW

S.NO	TOPIC	TOPIC OBJECTIVES
1	Cysts of the jaws	**Classify** Odontogenic and non-odontogenic cyst of the jaws. Discuss the origin of Odontogenic and non-odontogenic cyst of the jaws.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Odontogenic cysts	**Compare** the clinical, radiographic, histological features and pathogenesis of Odontogenic cyst including: - Periapical (radicular) cyst; - Dentigerous and eruption cyst; - Odontogenic keratocyst; - Gingival cyst; - Lateral periodontal cyst; - Calcifying odontogenic cyst; - Glandular odontogenic cyst.
3	Non-odontogenic cyst	**Describe** clinical, radiographic and histological features of Non-odontogenic cyst including: - Nasopalatine cyst; - Nasolabial cyst; - Median cyst; - Globulomaxillary cyst;
4	Non-epithelial/ pseudocyst	**Describe** clinical, radiographic and histological features of Non-epithelial/ pseudo cyst including: - Traumatic bone cyst; - Stafne's bone cavity; - Anerysmal bone cyst.

COURSE TOPIC: ODONTOGENIC TUMORS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Odontomas and Odontogenic tumors	**Classify** odontogenic tumors. **Describe** etiology, pathogenesis, clinical and diagnostic features of tumors of odontogenic epithelium: - Ameloblastoma; - Squamous odontogenic tumors; - Calcifying epithelial odontogenic tumor; - Adenomatoid odontogenic tumor. **Describe** etiology, pathogenesis, clinical and diagnostic features of mixed odontogenic tumors: - Ameloblastic fibroma; - Ameloblastic fibro odontome; - Odontoma.
2	Non-Odontogenic Tumors	**Discuss** the behaviour of benign mesenchymal odontogenic tumors: - Odontogenic fibroma; - Odontogenic myxoma; - Cementoblastoma.

COURSE TOPIC: VESSICULOBULLOUS LESIONS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Vesicullobullous Conditions	Discuss the histopathological features of following vesiculobullous conditions: - Herpes Simplex infection; - Varicella Zoster infection; - Pemphigus vulgaris; - Mucous membrane pemphigoid; - Bullous pemphigoid.
2	Ulcerative Condition	Discuss the histopathological features of following ulcerative conditions: - Immunological diseases; - Aphthous ulcers; - Behcets syndrome; - Erythema multiforme.
3	Fungal Infection	Discuss the histopathological features of Candidiasis.

COURSE TOPIC: VERRUCAL-PAPILLARY LESIONS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Benign lesions associated with Human Papilloma Virus	Describe the etiology, pathogenesis and diagnostic features of the following reactive/infectious lesions: - Squamous cell papilloma; - Papillary hyperplasia; - Condyloma latum; - Condyloma acuminatum; - Focal epithelial hyperplasia.

COURSE TOPIC: WHITE and COLORED LESION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Classification of White lesions	**Classify** white lesion of oral mucosa according to their etiology.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Hereditary white lesions	**Describe** hereditary white lesions: - Oral epithelial nevus; - Leukoedema; - Hereditary benign intraepithelial dyskeratosis; - Follicular keratosis.
3	Reactive white lesions	**Describe** reactive white lesions - Frictional hyperkeratosis; - Nicotine stomatitis; - Hairy leukoplakia; - Hairy tongue.
4	Preneoplastic and neoplastic white lesions	**Describe** etiology, pathogenesis, clinical features, histopathology and prognosis of the following: - Leukoplakia; - Oral Submucous fibrosis; - Lichen planus; - Lupus erythematosus; - Actinic cheilitis.
5	Vascular lesions	**Discuss** etiology, pathogenesis, clinical features, and histopathology of Congenital Hemangioma.
6	Reactive lesions	**Discuss** etiology, pathogenesis, clinical features, and histopathology of the following reactive lesions: - Pyogenic granuloma; - Peripheral giant cell granuloma; - Peripheral Fibroma; - Generalized Gingival Hyperplasia; - Denture Induced Fibrous Hyperplasia.

COURSE TOPIC: SQUAMOUS CELL CARCINOMA AND EPITHELIAL TUMOR

S.NO	TOPIC	TOPIC OBJECTIVES
1	Squamous cell carcinoma	**Explain** the etiology, epidemiology, pathogenesis, clinical features, histopathology and prognosis of squamous cell carcinoma. **Describe** staging and grading of squamous cell carcinoma.
2	Basal Cell Carcinoma	**Explain** the etiology, pathogenesis, clinical features, and histopathology of Basal Cell Carcinoma.

COURSE TOPIC: SALIVARY GLAND DISEASES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Reactive lesions of salivary gland	**Describe** reactive lesions of Salivary glands: - Mucous extravasation phenomenon; - Mucus retention cyst; Necrotizing sialometaplasia.
2	Bacterial and Viral Infections of y Gland	**Describe** pathogenesis, clinical and diagnostic features of the infections of the salivary glands: - Mumps; - Bacterial sialadenitis; - Sarcoidosis; - Sjogren's syndrome; - Xerostomia; Cytomegaloviral sialadenitis.
3	Salivary gland tumors	**Discuss** the pathogenesis, clinical and diagnostic features of salivary gland tumors: - Pleomorphic adenoma; - Warthin tumor; - Basal cell adenoma; - Oncocytoma; - Canalicular adenoma; - Mucoepidermoid carcinoma; - Acinic cell carcinoma; Adenoid cystic carcinoma.

COURSE TOPIC: METABOLIC AND GENETIC DISEASE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Inherited and developmental disorder of bone	Discuss the following genetic abnormalities and associate the developmental disorders with dental defects: - Cherubism; - Osteopetrosis; - Cleidocranial dysplasia.
2	Fibro-osseous lesion	**Discuss** etiology, clinical features, pathogenesis and behaviour of fibro-osseous lesions.

S.NO	TOPIC	TOPIC OBJECTIVES
3	Metabolic and endocrinal disorder of bone	Discuss the pathogenesis and diagnostic features of following metabolic conditions: - Paget's disease; - Hyperparathyroidism; - Hypothyroidism; - Hyperthyroidism; - Hypophosphastasia.
4	Central giant cell granuloma	**Describe clinical and diagnostic features** central giant cell granuloma
5	Tumors of bone	**Classify** bone tumors. **Describe** etiology, pathogenesis, clinical and diagnostic features of bone tumors including: - Osteoma and osteoblastoma; - Osteosarcoma; - Ossifying fibroma.

TEMPOROMANDIBULAR JOINT DISORDERS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Developmental disorders	Discuss the developmental disorders of TMJ: - Aplasia; - Hyperplasia; - Hypoplasia of mandibular condyle.
2	Inflammatory Disorders	Discuss the inflammatory disorders of TMJ: - Traumatic arthritis; - Infective arthritis; - Rheumatoid arthritis.
3	Osteoarthritis	Discuss causes and clinical features of osteoarthritis.
4	Functional Disorders	Discuss causes and clinical features of Myofacial pain dysfunction syndrome and Disc displacement.

ORAL MEDICINE AND DIAGNOSIS

COURSE TOPIC: PRINCIPLES OF INVESTIGATIONS AND DIAGNOSIS

S.NO	TOPIC	TOPIC OBJECTIVES
1	History taking	Record a comprehensive history. Discuss the significance of each component of history, e.g. importance of recording the presenting complaint in the patient's own words, impact of an underlying dental condition on the patients' oral health management.
2	Investigations	Perform extraoral and intraoral examination: - TMJ and muscles of mastication; - Cervical lymph nodes; - Cranial nerve examination, with emphasis on CN V and VII. Interpret findings seen on the following investigations: - Haematological; - Radiological; - Histological; - Specialized imaging, e.g. Sialography, CT scan, MRI, Radioisotope scan; - Molecular biology; - Culture and sensitivity testing, Serology, PCR; - Immunohistochemistry.
3	Diagnosis	Formulate differential diagnoses for common oral pathologies on the basis of - Site of lesion; - Type/physical characteristics of the lesion.
4	Treatment planning	Formulate treatment plans for common oral and maxillofacial pathologies presenting to the dental OPD.

COURSE TOPIC: ORAL INFECTIONS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Bacterial infections	Describe the signs, symptoms and clinical features of bacterial infections of the oro-facial region: - Odontogenic infections, Cellulitis, Ludwig's angina; - Actinomycosis; - Syphilis. List the investigations required to reach a diagnosis Manage patients presenting with bacterial infections to the dental OPD. Justify the choice of antibiotic use in treating bacterial infections. List down reasons for failure of antibiotic therapy.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Viral infections	Discuss signs, symptoms and clinical features of viral infections of oro-facial region: - Herpes simplex virus; - Varicella zoster virus; - Coxsackie virus; - Epstein Barr virus; - Cytomegalovirus; - Human immunodeficiency virus. Manage patients presenting with viral infections to the dental OPD. Justify the choice of antiviral therapy.
3	Fungal infections	Classify fungal infections. Discuss the signs, symptoms and clinical features of fungal infections of the oro-facial region. List investigations required for diagnosis. Manage patients presenting with fungal infections to the dental OPD. Discuss reasons for failure of antifungal therapy.

COURSE TOPIC: ORAL ULCERATIVE LESIONS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Classification	Classify oral ulcerative lesions on the basis of aetiology.
2	Non-vesiculobullous conditions	Discuss the clinical features of the non-vesiculobullous conditions affecting the oral cavity. List the investigations available for diagnosis of non-vesiculobullous conditions. List the common pharmacological treatment options for management of non-vesiculobullous conditions.
3	Vesiculo-bullous ulcers conditions	Discuss the clinical features of vesiculo-bullous conditions affecting the oral cavity. List investigations available for diagnosis of vesiculo-bullous conditions. Discuss the common pharmacological treatment options for management of vesiculo-bullous conditions.

COURSE TOPIC: ORAL SOFT TISSUE LESIONS

S.NO	TOPIC	TOPIC OBJECTIVES
1	White lesions	Classify white lesions of the oral cavity. Differentiate white lesions on the basis of their etiology, history and clinical features. Discuss management options of persistent, unresolving white lesions.
2	Red lesions	Classify red lesions of the oral cavity. Differentiate red lesions on the basis of their etiology, history and clinical features. Discuss management options of persistent, unresolving red lesions.
3	Pigmented lesions	Classify pigmented lesions of the oral cavity. Differentiate between malignant melanoma and other pigmented lesions of the oral cavity. Discuss management of malignant melanoma.
4	Premalignant lesions and conditions	Differentiate between premalignant lesions and conditions. Discuss management of dysplastic lesions. List risk factors for malignant changes in oral premalignant lesions/conditions.

COURSE TOPIC: MOTOR AND SENSORY CHAGES IN THE OROFACIAL REGION

S.NO	TOPIC	TOPIC OBJECTIVES
1	Facial pain	Differentiate among various presentations of facial pain based on the history and clinical examination. Describe clinical features, diagnosis and management of: - Trigeminal neuralgia; - Atypical facial pain; - Burning mouth syndrome.
2	Facial palsy	List causes of facial palsy. Diagnose Bell's palsy in patients presenting to the dental clinic. Manage patients presenting to the dental clinic with facial palsy.

COURSE TOPIC: SALIVARY GLAND DISORDERS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Salivary flow obstruction	Classify salivary flow obstruction on the basis of aetiology.
2	Infections (sialoadenitis)	Describe the clinical features of bacterial and viral sialoadenitis. Manage patients presenting to the dental OPD with sialoadenitis.

COURSE TOPIC: TEMPOROMANDIBULAR JOINT DISORDERS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Evaluation	Discuss common signs and symptoms associated with TMJ disorders. Discuss current investigations available for the evaluation of TMJ disorders, e.g. arthrography, CT scan, MRI.
2	Treatment	List common pharmacological treatment options, occupational therapy, prosthetic splint therapy, alternative dental therapy for pain.

COURSE TOPIC: SYSTEMIC DISORDERS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Cardiovascular diseases	Discuss clinical considerations for dental management of patients: - with cardiovascular diseases; - on warfarin therapy; - on antiplatelet medication. Describe current guidelines for antibiotic prophylaxis for infective endocarditis. Discuss oral manifestations of antihypertensive medication.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Respiratory diseases	Discuss the management of an asthmatic and chronic obstructive pulmonary disease patient. Discuss clinical features, investigations and treatment of Sarcoidosis
3	Gastrointestinal diseases	Discuss oral manifestations of GI diseases: - Crohn's disease; - Ulcerative colitis; - Orofacial granulomatosis; - Coeliac disease; - Hepatitis B and C. Discuss considerations for dental management of a patient with inflammatory bowel disease, Hepatitis B and C.
4	Renal diseases	Discuss oral manifestations of renal diseases. Discuss considerations for dental management of a patient with chronic renal disease.
5	Haematological diseases	Discuss oral manifestations of haematological diseases: - Anaemia; - Leukaemia; - Lymphoma. Discuss considerations for dental management of a patient with haematological disease.
6	Haemorrhagic diseases	Discuss oral manifestations of haemorrhagic diseases: - Purpura; - von Willebrand's disease; - Haemophilia. Discuss considerations for dental management of a patient with haemorrhagic disease.

PERIODONTOLOGY

COURSE NAME: ANATOMY BIOLOGY AND DEVELOPMENT OF STRUCTURES OF PERIODONTIUM

S.NO	TOPIC	TOPIC OBJECTIVES
1	External anatomic features of oral cavity	**Explain** external anatomic features related to the periodontium. Describe types of oral mucosa and their characteristics.
2	Gingiva	Describe the macroscopic and microscopic features of gingiva. **Describe** morphologic characteristics of different areas of gingival epithelium and connective tissues. **Discuss** the histology of epithelium - connective tissue interface. **Describe** the development of Gingiva. List the blood supply, nerve supply and lymphatics of gingiva.
3	Periodontal Ligament	Define Periodontal Ligament. **Describe** structure, cellular composition and extracellular components of PDL. Discuss the development of principal fibers of PDL. Describe the blood supply, nerve supply and lymphatics of the PDL. **List** the various functions of PDL. **Correlate** the changes in the PDL space in different clinical conditions.
4	Cementum	**Define** Cementum. **Classify** different types of cementum. **List** composition, functions, vascularization, innervation and characteristics of cementum. **Name** structures involved in Cemento-enamel and cemento-dentinal junction. **Describe** the phenomena of cemental resorption andrepair.
5	Alveolar Bone	**Define** Alveolar bone. Describe various parts and composition of alveolar bone. **Differentiate** between fenestration and dehiscence. **Differentiate** between the periosteum and endosteum. **Describe** the process of remodelling and resorption of alveolar bone. **Describe** the blood supply, nerve supply and lymphatics of the bone.

COURSE TOPIC: INFLAMMATION AND WOUND HEALING

S.NO	TOPIC	TOPIC OBJECTIVES
1	Periodontal changes with aging	**List** general effects of aging. **Describe** age changes in Periodontium. **Discuss** effects of aging on progression of periodontal diseases. **Describe** the effects of treatment on aging individual.

COURSE NAME: CLASSIFICATION AND EPIDEMIOLOGY OF GINGIVAL and PERIODONTAL DISEASE

S.NO	TOPIC	TOPIC OBJECTIVES
1	Classification system of Periodontal Diseases	**Discuss** the need for classification. **Classify** Periodontal diseases according to current classifications. **Describe** characteristic of gingival and periodontal diseases.
2	Epidemiology of Gingival and Periodontal Disease	**Define** Epidemiology and Index. **Classify** different types of epidemiologic research. **State** the Purpose and use of an index. **Discuss** the Characteristics of an Ideal Index. **Discuss** various indices used to assess different periodontal problems.

COURSE NAME: ETIOPATHOGENESIS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Periodontal microbiology (Dental Plaque)	**Define** a Bio-film. **Describe** dental Plaque as biofilm. **Discuss** the steps in formation of dental plaque. **Explain** the structural and microscopic properties of dental plaque. **Describe** the clinical significance of dental plaque. **List** microorganisms associated with various periodontal disease.
2	Calculus and other Etiological Factors	**Define** calculus. **Differentiate** between different types of calculus, their composition and formation. De**scribe** calculus as a pathogenic potential in periodontal disease. **Describe** other etiological factors contributing to gingival and periodontal disease. Discuss features of various extrinsic and intrinsic stains seen on tooth surfaces.
3	Host response: Basic concepts	**Discuss** the role of saliva, gingival epithelium and gingival crevicular fluid in the host defense mechanism. **Describe** process of inflammatory cell response and immunologic response in the host defense mechanism.

S.NO	TOPIC	TOPIC OBJECTIVES
4	Trauma from Occlusion	**Describe** the physiologic adaptive capacity of periodontium to occlusal force. **Define** Trauma from Occlusion. **List** the types, signs and symptoms of trauma from occlusion. **Describe** the histologic changes from trauma due to occlusion. **Describe** the Pathologic tooth migration phenomena.
5	Role of systemic diseases	**Describe** the Dietary and nutritional aspect of periodontal disease. **Interpret** the effect of hematologic, metabolic and endocrine disorders on periodontium. **Describe** the effect of cardiovascular diseases on periodontium. **Outline** the effects of Antibody deficiency disorders on periodontium.
6	Oral Malodor	**Classify** halitosis. **List** various etiology responsible for halitosis. **Diagnose** halitosis based on history, clinical examination and appropriate investigations. **Manage** patients presenting to the dental clinic with oral malodor.
7	Pathogenesis of periodontal disease	**Describe** the Role of bacterial invasion, exotoxins, cellular constituents and enzymes in causing periodontal disease. **Describe** the Evasion of host response in causing periodontal disease. **List** the Host derived bone resorbing agents.
8	Periodontal medicine	**Describe** Era of focal infection. **Discuss** association between Periodontal disease and: - CHD/ Atherosclerosis; - IHD, Thrombogenesis, Artherosclerosis; - Stroke; - Diabetes mellitus; - Pregnancy outcome; - COPD; - Acute respiratory infection. **Describe** the role of periodontal medicine in clinical practice.
9	Smoking and periodontal disease	**List** the effects of smoking on prevalence, severity, etiology and pathogenesis of periodontal disease. **List** effects of smoking on the response to periodontal therapy.

COURSE NAME: PERIODONTAL PATHOLOGY - GINGIVAL DISEASES

S.NO	TOPIC	TOPIC OBJECTIVES
1	Defense Mechanisms	**List** various defense mechanisms of the gingiva. **Describe** the anatomy of gingival crevice. **Discuss** the significance of gingival sulcus and fluid. **Discuss** the significance of gingival vasculature and crevicular fluid. **Explain** the methods of collection of sulcular fluid. **Discuss** the composition and clinical significance of GCF. **Discuss** the effect of drugs in gingival fluid. **Interpret** the relationship of periodontal therapy and gingival fluid.
2	Gingival Inflammation	**List** salient features of the initial, early, established, advanced lesion of gingivitis.
3	Clinical features of Gingivitis	**Classify** different types of Gingivitis. **List** various clinical features of gingivitis. **Describe** gingival bleeding on probing. **Explain** colour changes of gingival in gingivitis. **Describe** the change in consistency of gingiva in gingivitis. **Discuss** the change in size of gingival in gingivitis. **Discuss** the surface texture of gingivia. **Explain** the change in position of gingiva in gingivitis.
4	Gingival Enlargements	**Classify** gingival enlargement. **Explain** various inflammatory and non-inflammatory enlargement of gingiva. **Explain** various enlargement of gingiva associated with systemic disease. **List** different neoplastic conditions of gingival enlargement. **Describe** the false enlargement of gingiva.
5	Acute Gingival Infections	**Classify** various acute gingival lesions. **Discuss:** - Acute necrotizing ulcerative gingivitis; - Acute herpetic gingivostomatitis; - Pericoronitis.
6	Periodontal Disease in Children and Young Adolescents	**Describe** anatomical consideration of periodontal disease in children and young adolescents. **Classify** periodontal diseases in children. **Describe** histopathology and microbiology of periodontal disease in children. **Describe** the following gingival and periodontal lesions: - Acute herpetic gingivostomatitis; - Necrotizing ulcerative gingivitis; - Candidiasis; - Prepubertal periodontitis; - Juvenile periodontitis. **Describe** various Periodontitis associated with syndromes.

S.NO	TOPIC	TOPIC OBJECTIVES
7	Desquamative Gingivitis	**Discuss** the diagnosis of desquamative gingivitis. **Describe** the clinical features and histopathology of various forms of desquamative gingivitis. **Describe** the therapy for desquamative gingivitis. **Describe** diseases clinically presenting as desquamative gingivitis.

COURSE NAME: PERIODONTAL PATHOLOGY– PERIODONTAL DISEASES I

S.NO	TOPIC	TOPIC OBJECTIVES
1	Periodontal Pocket	**Define** a periodontal pocket. **Classify** different types of periodontal pockets. **Describe** clinical features, pathogenesis, histopathology and treatment of periodontal pocket. **Describe** features of a periodontal cyst. **Perform** pocket depth measurement in patients presenting with periodontitis in the dental OPD.
2	Bone loss and patterns of bone destruction	**Discuss** the normal anatomy of alveolar bone. **Describe** the mechanism of bone formation and destruction. **Describe** the factors determining bone morphology in periodontal disease. **Describe** the bone destruction patterns in periodontal disease. **Describe** the prevalence and distribution in bone defects.
3	Chronic Periodontitis	**Define** chronic periodontitis. **Discuss** the Diagnostic criteria for chronic periodontitis. **Compare** different types Based on disease distribution and severity. **Describe** the Nature of disease progression. **Describe** the Risk factors for chronic periodontitis.

S.NO	TOPIC	TOPIC OBJECTIVES
4	Aggressive Periodontitis	**Describe** in detail Localized and Generalized Aggressive Periodontitis.
5	Necrotizing Ulcerative Periodontitis, Refractory Periodontitis	**Describe** types of Necrotizing ulcerative and Refractory Periodontitis.
6	Periodontitis as a manifestation of systemic disease and Aids and the Periodontium	**Describe** Periodontitis as a manifestation of Systemic disease. **Explain** briefly about HIV opportunistic infection. **Classify** periodontal diseases associated with HIV infection. (Linear gingivitis, necrotizing ulcerative gingivitis, Necrotizing ulcerative Periodontitis, Necrotizing stomatitis). **Explain** the periodontal diseases associated with HIV infection. **Explain** common manifestation of HIV infection (hairy leukoplakia, Oral candidiasis, Kaposi sarcoma). **Plan** management of AIDS and HIV associated periodontitis.

COURSE NAME: TREATMENT OF PERIODONTAL DISEASES - DIAGNOSIS, PROGNOSIS and TREATMENT PLAN

S.NO	TOPIC	TOPIC OBJECTIVES
1	Diagnosis of Periodontal Disease Various Aids and Diagnostic techniques	**Discuss** the Periodontal Diagnosis. **Explain** the Principles of diagnosis. **Describe** in detail the Clinical diagnosis of periodontium. **Prepare** a Case history Performa for periodontal diagnosis. **Define** Risk factors for periodontal disease. **List** the risk factors, risk determinants and indicators for periodontal disease. **E**xplain Risk determinants and risk indicators for periodontal disease. **Identify** the Risk markers/predictors for periodontal disease. **Assess** the Clinical risk for periodontal disease. **List** the Aids used in clinical diagnosis. Explain each of the following in detail. (Periodontal probes, Conventional probes, PSR).

S.NO	TOPIC	TOPIC OBJECTIVES
		Discuss the following aids used in periodontal diagnosis: - Radiographic aids (OPG, Xeroradiography, Advanced radiographic techniques- Iodine, Photo densitometric analysis, Digital radiography - Microbiologic aids; - Immunological aids (Immuno flourescence, Latex agglutination, Elisa, Flow Cytometry); - Biochemical aids; - Other diagnostic aids (BANA test, FSEIA, PCR).
2	Determination of Prognosis Related Risk Factors	**Define** prognosis. **Explain** different types of prognosis. **List** the factors responsible for determination of prognosis. **Discuss** the relationship between diagnosis and prognosis. **Discuss** the re-evaluation of prognosis after phase I therapy.
3	Rationale for Periodontal Treatment Treatment plan	**List** the objectives of periodontal therapy. **List** various local and systemic factors which affect healing. **Describe** the Healing phenomena after periodontal therapy. **Outline** the Sequence of therapeutic Procedures. **Plan** the diagrammatic layout of Preferred Sequence of periodontal therapy.
4	Periodontal Armamentarium	**Describe** Periodontal Instrument. **Classify** Periodontal Instrument.

COURSE NAME: TREATMENT OF PERIODONTAL DISEASES - NON-SURGICAL

S.NO	TOPIC	TOPIC OBJECTIVES
1	Principles of Periodontal Instrumentation Including Scaling and Root Planning	**Describe** clinician position and patient position. **Discuss** visibility, illumination and retraction with procedure. **Discuss** the condition of instruments. **Describe** the importance of maintaining a clean field. **Describe** the importance of instrument stabilization (instrument grasp, finger rest). **Describe** the procedure of instrument activation. **Explain** the principles of scaling and root planning. **Describe** the working of ultrasonic instruments.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Plaque Control	**List** the goals of plaque control measures. **Discuss** the rationale for plaque control. **Describe** various basic approaches for plaque control. **Describe** mechanical plaque control methods. **Describe** the chemical plaque control methods.

COURSE NAME: TREATMENT OF PERIODONTAL DISEASES - SURGICAL

S.NO	TOPIC	TOPIC OBJECTIVES
1	Principles of Periodontal Surgery	**List** the indications, contraindications and general principles for periodontal surgery. **Describe** the complications during procedure and first post-operative week. **Describe** the Hospital periodontal surgery.
2	Gingival Curettage	**Define** gingival curettage. **Classify** different types of gingival curettage. **Discuss** the rationale of gingival curettage. **List** the indications of gingival curettage. **List** various procedures of gingival curettage. Explain various procedures of gingival curettage (basic techniques, enap, ultrasonic curettage, caustic drug). **Describe** the phase of healing after scaling and curettage. **Describe** the clinical appearance after scaling and curettage.
3	Ginigivectomy	**Define** gingivectomy. **List** the prerequisite, indications, contraindications for gingivectomy. **Classify** gingivectomy **Describe** different types of gingivectomy.

S.NO	TOPIC	TOPIC OBJECTIVES
4	Periodontal Flap	**Classify** different types of flaps. **List** the indications/objective of flap surgery. **Define** a periodontal flap. Discuss different types of incisions. **Describe** different flap techniques for pocket therapy. **Describe** the phase of healing after flap surgery.
5	Osseous and Mucogingival Surgery	**Define** osseous and mucogingival surgery. **Discuss** the rationale for osseous surgery. **Itemize** different types of osseous surgery. **List** the indications and contraindications of resective osseous surgery and mucogingival surgery. **List** the examination prior to resective surgery. **List** various methods of osseous surgery. **Describe** the phase of healing after ressective osseous surgery. **Describe** in detail the reconstructive osseous surgery. **List** various mucogingival problems. **Describe** various techniques to increase width of attach gingiva. **Describe** indications, classification and procedure for root coverage by conventional flaps. **Describe** subepithelial connective tissue graft and its modification. **Describe** the guided tissue regeneration technique for root coverage. **Describe** in detail operation for removal of frena.
6	Furcation involvement and its management	**Define** furcation involvement. **Classify** different grades of furcation involvement. **Describe** etiology, clinical features, prognosis and treatment of furcation involvement (traditional, reconstructive, resective treatment).
7	Pulpoperiodontal problems	**Classify** pathways of communication between pulp and periodontium. **Describe** effects of pulp disease on periodontium, periodontitis on pulp **Classify** endo-perio lesion. **Describe** microbiological findings, diagnosis and treatment of endo-perio lesion.

S.NO	TOPIC	TOPIC OBJECTIVES
8	Splints and Role of orthodontics in Periodontal Therapy	**Define** dental and periodontal splinting. **List** the objectives of splinting. **Classify** splints. **List** principles, indications, contraindications, advantages and disadvantages of splinting. **Describe** rationale, indications and contraindications for orthodontic treatment in periodontal therapy. **Discuss** the timing of orthodontic procedure in periodontal treatment. **Discuss** the iatrogenic effect associated with orthodontic treatment. **Discuss** the response of periodontal ligament to orthodontic forces.
9	Periodontal: Restorative Inter-Relationship	**Discuss** the interrelationship of margins of restoration, crown contour, hypersensitivity to dental material, proximal contacts to periodontium.
10	Drugs used in Periodontal Therapy	**Describe** the Drugs used in periodontal therapy.
11	Host-modulation	Discuss the host-modulation therapy. List drugs used and the regimen for host-modulation.

OPERATIVE DENTISTRY & ENDODONTICS

COURSE TOPIC: OPERATIVE DENTISTRY

S.NO	TOPIC	TOPIC OBJECTIVES
1	Biologic Considerations in Operative Dent-istry	Discuss the chemical composition, structure and properties of: - Enamel; - Dentin; - Pulp; - Cementum; - Gingiva. Discuss the morphologic and histologic structure of tooth tissues with their clinical impact on restorations. Discuss the importance of dentogingival complex and biologic width when planning restorations.
2	Patient Evaluation and Problem Oriented Treatment Planning	Define treatment oriented treatment planning. Discuss merits and drawbacks of treatment oriented treatment planning and problem oriented treatment planning. Discuss the importance of a thorough dental and dental history. Take dental and dental history of a patient presenting to the dental clinic. Discuss elements of a clinical examination. Perform extra oral and intraoral examination on a patient presenting to the dental clinic. Discuss esthetic parameters to be considered when restoring the dentition. Formulate a logical treatment plan Discuss the importance of dental record keeping.
3	Preliminary Considerations in Operative Dentistry	Justify the need for correct patient and operator positions when carrying out restorative procedures. Demonstrate the ideal operating positions when carrying out various procedures. Discuss the importance of isolation in operative dentistry. Describe different methods used for isolation. Describe the armamentarium required for rubber dam isolation. Describe application and removal of rubber dam for operative dentistry procedures. Perform application and removal of rubber dam on patients when carrying out a restorative procedure.

S.NO	TOPIC	TOPIC OBJECTIVES
4	Sterilization And Disinfection	Differentiate among the following: - Sterilization; - Disinfection; - Asepsis. Discuss the importance of sterilization and disinfection. Discuss elements of a sterilization plan. Describe various methods used for sterilization and methods to monitor effectiveness of sterilization. List chemicals that are used for disinfection. Define cross infection. Explain the exposure risks in dentistry. Discuss the different methods of cross infection control in the dental office.
5	Assessment of Radiographs	Describe importance of radiographs in operative dentistry. Identify normal anatomic structures of maxilla and mandible on a: - Periapical x-ray; - Bitewing x-ray; - Occlusal x-ray; - Orthopantomogram (OPG). Discuss the indications and limitations of the following x-rays views for diagnostic purposes: - Periapical x-ray; - Bitewing x-ray; - Occlusal x-ray; - Orthopantomogram (OPG). Interpret pathological findings seen on these radiographs. Discuss the biological effects and risks associated with radiations.
6	Dental Caries-Etiology and Clinical Characteristics	Define dental caries. Discuss etiology and pathogenesis of dental caries. Describe factors influencing dental caries process. Discuss role of plaque biofilm in progression of dental caries. Describe microorganisms responsible for dental caries. Describe the Stephan's curve. Describe clinical characteristics and progression of carious lesions as seen on: - Pit and fissures; - Smooth surfaces; - Root surfaces. Describe the progression of carious lesions in: - Enamel; - Dentin. Discuss the different zones of enamel and dentin caries.

S.NO	TOPIC	TOPIC OBJECTIVES
7	Dental Caries- Diagnosis and Management	Discuss methods of detection and diagnosis of dental caries. Diagnose dental caries in patients based on clinical and radiographic examination. Describe International Caries Detection and Assessment System (ICDAS II). Discuss how to assess dental caries risk for a patient. Assess dental caries risk for a patient. Discuss Caries Management by Risk Assessment (CAMBRA). Discuss protocols and strategies for prevention of dental caries. Discuss non-invasive options for treatment of existing lesions. Define caries control restorations. Describe the clinical protocol for caries control restorations. Justify the need of a logical treatment plan sequence for restoring a patient's dentition. Counsel patients regarding measures to prevent dental disease. Discuss maintenance care and recall visit intervals for patients based on risk assessment.
8	Management of Deep Carious Lesion	Define: - Stepwise excavation; - Indirect pulp cap; - Direct pulp cap (carious and iatrogenic). Discuss the various possible reactions of the pulp-dentin complex to a deep carious lesion. Discuss the rationale of stepwise excavation. List materials that can be used for direct and indirect pulp cap. Describe the clinical protocol for direct and indirect pulp cap procedures. Perform indirect and direct pulp cap restorations on permanent teeth.
9	Nomenclature, Principles of Cavity Design and Preparation. Class I- Class VI	Classify carious lesions. Describe different systems for naming and numbering teeth. Describe the nomenclature of tooth surfaces and cavity preparation. Describe the objectives of tooth preparation. List factors that need to be considered before tooth preparation. Describe the steps in the initial and final stages of tooth preparation. Discuss shortcomings of Black's cavity classification. Describe the advances in material sciences that have made cavity preparation minimally invasive.

S.NO	TOPIC	TOPIC OBJECTIVES
10	Instruments and Equipment for Tooth Preparation	List various cutting and non-cutting hand instruments. Discuss the design features for hand cutting instruments. Discuss the nomenclature for hand cutting instruments. Describe sharpening of hand instruments. Demonstrate various instrument grasp techniques. Describe rotary cutting equipment and instruments. Discuss common design characteristics of rotary cutting instruments (dental burs). Discuss latest developments for tooth preparation and caries removal including: - Lasers; - Ozone; - Air abrasion. Discuss hazards with cutting instruments and their prevention.
11	Occlusion	Define the terms: - Occlusion; - Static occlusion; - Dynamic occlusion; - Centric relation; - Maximum intercuspation; - Supporting cusps; - Non supporting cusps. Explain the types and directions of mandibular movements. Discuss the importance of restoring occlusion in restorative dentistry.
12	Review of Restorative Materials	Discuss the composition, properties, merits and shortcomings of materials used for direct restorations: - Amalgam; - GIC; - Composite.

S.NO	TOPIC	TOPIC OBJECTIVES
13	Amalgam Restorations	Discuss advantages and disadvantages of amalgam restorations. Describe class I cavity preparation. Explain the outline form of a class II cavity preparation. Discuss ways of improving resistance and retention form of a simple class I and II restoration. Explain ways of improving resistance and retention form of complex restorations. Describe the need for cuspal coverage with special reference to rule of thirds. Describe for amalgam restorations: - Box only preparation; - Tunnel preparation; - Slot preparation. Describe bonded amalgam restorations and the mechanism of amalgam bonding. Discuss cavity preparation of a class VI lesion. Describe placement of amalgam in simple and complex cavities. Describe types of dentin pins and their method of placement. Describe other mechanical features to improve resistance and retention. Discuss importance of matricing and wedging. List various types of matrix band systems and wedges. Describe the various parts of a tofflemire matrix band. Demonstrate placement of tofflemire matrix band and wedge on patients when restoring multi-surface cavities. Discuss mercury hazards and hygiene. Perform on patients: - Class I cavity preparation and amalgam restoration; - Class II cavity preparation and amalgam restoration; - Class VI cavity preparation and amalgam restoration.
14	Bonding to Enamel and Dentin	Classify modern adhesives. List advantages of adhesive techniques over non-adhesive methods. Explain why enamel is a favorable substrate for bonding. Differentiate structure of dentin from enamel. Discuss the effect of smear layer on dentin bonding. Explain the effect of Configuration Factor (C-factor) on bonding. Explain the effect of acid conditioning on enamel. Discuss difficulties in dentine conditioning. Discuss chemistry of primers and adhesive resin (bonding agent). Explain the importance of hybridization for effective dentine bonding. Describe 1st- 7th generation adhesives. Explain steps involved in enamel and dentin bonding. Describe the bond strength under optimal conditions.

S.NO	TOPIC	TOPIC OBJECTIVES
15	Direct Anterior Composite Restorations	Discuss the chemistry of anterior composites. Perform preoperative evaluation before placing an anterior composite restoration. Describe factors influencing shade selection. Discuss guidelines for shade matching and various methods of shade selection. Describe cavity preparation for class III restorations. Outline cavity preparation for class IV restorations. Discuss importance of matricing and wedging. Describe composite placement technique for class III and IV restorations. Discuss different instruments used for finishing and polishing of composite restorations and their use. Demonstrate placement of appropriate matrix and wedges on patients when restoring teeth with composite. Perform on patients: - Class III cavity preparation and composite placement; - Class IV cavity preparation and composite placement; - Finishing and polishing of composite restorations. List indications, contraindications, advantages and disadvantages of direct composite veneers. Describe clinical steps for placing direct resin composites veneer. Explain the technique for diastema closure with direct composite.
16	Direct Posterior Composite Restorations	Describe indications, contraindications, advantages and disadvantages for composite resin as a posterior restorative material. Demonstrate preoperative evaluation for a posterior composite restoration. List factors affecting retention of fissure sealants. Describe placement technique for fissure sealants and preventive resin restorations. Outline features of a class I and class II cavity for composite restoration. Justify the need of pre-wedging in class II composite restorations. Explain bonded base technique. Describe for composite restorations: - Box only preparation; - Tunnel preparation; - Slot preparation. Classify matrix systems available for composite restorations. Compare circumferential and sectional matrix systems.

S.NO	TOPIC	TOPIC OBJECTIVES
		Justify different methods used to minimize polymerization shrinkage. Discuss different methods to create a tight contact for class II composite restorations. Describe various resin polymerization equipment. Discuss cavity preparation and restoration of a class VI lesion. Demonstrate placement of appropriate matrix and wedges on patients when restoring teeth with composite. Perform on patients: - Pit and fissure sealants and preventive resin restorations; - Class I cavity preparation and composite restorations; - Class II cavity preparation and composite restorations; - Class VI cavity preparation and composite restorations.
17	Class 5 Restorations	Describe cavity preparation for class V restorations. Describe non-surgical and surgical techniques for isolating class V restorations. Discuss restorative materials available for restoring class V lesions. List ways of improving retention of class V composite restorations. Perform Class V cavity preparation on patients and restore it with appropriate restorative material.
18	Diagnosis and Treatment of Root Caries	Define root caries. Describe appearance and location of root caries. List etiology and risk factors associated with root caries. Diagnose root caries based on clinical and radiographic examination. Discuss preventive and chemotherapeutic strategies to manage root caries. Discuss available restorative materials for treating root caries. Perform cavity preparation and restoration of root caries with appropriate restorative material on patients.

S.NO	TOPIC	TOPIC OBJECTIVES
19	Tooth Surface Loss	Define the following types of tooth surface loss: - Abrasion; - Attrition; - Erosion; - Abfraction. - Dentine hypersensitivity Discuss the etiology, pathogenesis, prevention and management of tooth surface loss and dentine hypersensitivity.
20	Discoloration of Teeth	Describe causes of tooth discoloration. Describe nature of stains. Discuss mode of action of bleaching agent on stains. List commonly used bleaching agents and their strengths. Discuss indications and contraindications of various types of bleaching techniques. Explain technique for: - In-office vital bleaching; - At-home vital bleaching; - Non-vital bleaching. Describe the procedure for micro abrasion and macro abrasion.

COURSE TOPIC: ENDODONTICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Biology of Dental Pulp and Periradicular Tissue	Describe the anatomic regions of the pulp and their clinical importance. Describe the functions of the pulp-dentin complex. Describe the blood vessels, lymphatics and neural components of pulp. Discuss the distribution and function of the neural components of pulp. Discuss theories of dentin sensitivity. Explain the pathway of efferent nerves from the pulp to central nervous system. Discuss changes in pulp morphology with age. Describe the structure and function of periradicular tissues.

S.NO	TOPIC	TOPIC OBJECTIVES
2	Preserving Pulp Vitality	Describe physiologic and structural characteristics of pulp and how it affects pulp response to injury. Discuss iatrogenic effects on the dental pulp by: - Local anesthetics with vasoconstrictor; - Cavity/ crown preparation (thermal shock); - Depth of cavity preparation; - Various restorative materials; - Placement of pins; - Polishing restorations; - Post-restoration hypersensitivity; - Orthodontic tooth movement; - Vital bleaching. Discuss the formation and role of tertiary dentin in pulp protection. Explain preventive measures adopted during dental restorative procedures to preserve pulp vitality.
3	Endodontic Microbiology	Describe the routes of entry of microorganisms to the pulp and periradicular tissues. Discuss the different types of endodontic infections. Describe the various microbial species involved in various endodontic infections. Illustrate ecology of endodontic microbiota and features of endodontic ecosystem.
4	Pulp and PeriradicularPathosis	Classify pulpal diseases. Classify periradicular lesions of pulpal origin. Describe etiological factors of pulp inflammation. Explain mechanism of spread of inflammation in the pulp. Explain why the pulp has difficulty in recovering from severe injury. List specific and non-specific indicators of pulpal inflammation. Describe the clinical and histological features of pulp diseases. Explain the mechanism and consequences of spread of pulpal inflammation into periradicular tissues. Describe clinical and histological features of periradicular lesions of pulpal origin. Describe steps involved in repair of periapical pathosis. Describe non-endodontic lesions that may simulate endodontic periradicularpathosis.

S.NO	TOPIC	TOPIC OBJECTIVES
5	Endodontic Diagnosis and Treatment Plan	Discuss the importance of a thorough dental and dental history. Take dental and dental history of patient presenting to dental OPD. Discuss elements of a clinical examination. Perform extra oral and intraoral examination on patients to ascertain pulpal and periapical health. Describe various vitality tests, their advantages and limitations. Perform vitality tests on patients. Interpret findings of various vitality tests in clinical settings. Correlate radiographic findings to the history and clinical examination. Discuss the common dental diseases that may influence endodontic treatment planning. Discuss special considerations when formulating treatment plans for geriatric patients. Diagnose pulpal and periapical pathosis in patients based on history, clinical and radiographic examination. Develop a treatment plan. Take an informed consent before any treatment. Formulate a referral letter to an endodontist when required.
6	Endodontic Radiology	Describe importance of radiographs in endodontics. Identify normal anatomic structures of maxilla and mandible on periapical radiographs. Differentiate between endodontic and non-endodontic radiolucencies and radioopacities. Describe radiographic characteristics of periapical lesion of endodontic origin. Justify varying horizontal and vertical cone angulations to create image shift. Describe the SLOB rule. Describe new technologies for radiographic imaging.
7	Pulp Anatomy	Correlate the shape of pulp system to root anatomy. List laws of canal orifice location. **Discuss** pathologic factors that may cause alterations in pulp anatomy. Describe major components of the pulp space and variations in the pulp system in apical third. Determine radiographically the distance from occlusal/ incisal surface to the roof of chamber. Describe accessory canals. Discuss relationship of anatomic, radiographic and actual location of apical foramen.

S.NO	TOPIC	TOPIC OBJECTIVES
		Describe variations in pulp anatomy resulting due to: - Developmental defects; - With age. Identify the internal and external anatomy of teeth in sagittal and cross section.
8	Instruments in Endodontics	List basic set of instruments appropriate for various endodontic procedures. Describe the general physical properties of instruments. Describe the design of common canal preparation instruments and their proper use of to prevent breakage within canal. Explain the basis for sizing and taper of hand operated instruments. Identify visible changes in instruments that will predispose them to breakage. Describe techniques for sterilization and disinfection of endodontic instruments. Describe nickel titanium rotary instruments.
9	Local Anaesthesia in Endodontics	Define pain threshold and the factors affecting it. List techniques that are helpful in giving "painless" injections. Describe the "routine" approach to conventional local anaesthesia . Perform administration of topical and local (infiltration and block) anaesthesia before starting root canal treatment on patients. Describe circumstances that create difficulties in obtaining profound anaesthesia . Justify use supplemental methods of obtaining pulpal anaesthesia . Discuss techniques of intraosseous, periodontal ligament, and intrapulpal injections.

S.NO	TOPIC	TOPIC OBJECTIVES
10	Isolation, Endodontic Access, and Length Determination	Discuss methods of isolation in endodontics with emphasis on rubber dam isolation. Describe importance of pre-operative assessment as pre-requisite for treatment success. Discuss the importance of pre-endodontic buildup. Describe the objectives, general principles, procedure, armamentarium and sequence of endodontic access cavity preparation. Draw outline of access cavity of each tooth. Describe average length and canal configuration of various teeth. Describe technique for locating canal orifices. Identify errors during access cavity preparation and know how to correct them. Describe various methods of working length determination. Perform rubber dam isolation before starting endodontic treatment. Prepare access cavity on single rooted teeth (extracted teeth/patients). Determine working length of single rooted teeth (extracted teeth/patients).
11	Cleaning and Shaping	Differentiate pulp space infection from infection in other tissues of body. Discuss purpose of cleaning and shaping the pulp space. Explain the concept of apical patency. Describe basic and combined instruments movements. Describe different techniques of canal preparation. Explain how to minimize preparation errors in curved canal. Discuss management of calcified canals. Justify use of NiTi rotary instruments and its efficacy over SS files. Explain the importance, properties and irrigation techniques of irrigants. Name various agents used for irrigation. Perform: - Pulpectomy of single rooted teeth (extracted teeth/patients); - Cleaning and shaping of root canal (extracted teeth/patients); - Root canal irrigation (extracted teeth/patients).

S.NO	TOPIC	TOPIC OBJECTIVES
12	Intra Canal Medicaments and Temporary Filling Materials	Name different microorganisms involved in endodontic pathosis. Define intra canal medicament. Discuss the properties, role, method of application and instruments used in intra-canal, inter-appointment medicaments. Categorize various agents used as intra-canal medicament. List temporary filling materials used in endodontics. Describe techniques for placement and removal of temporary filling materials. Demonstrate the placement of intracanal medicament in a root canal.
13	Root Canal Obturation	Describe the rationale of obturation. Describe the clinical criteria that determine time of obturation. List the properties of ideal core obturation material and sealer. Name core obturation materials, sealers and obturation techniques. Describe the composition and properties of gutta percha. Describe advantages and disadvantages of each core material. Justify the need for using a sealer during obturation. Describe lateral condensation technique. Describe briefly other techniques used for obturation. Discuss the radiographic criteria for evaluating the quality of obturation. Perform obturation of single rooted teeth (extracted teeth/patients).
14	Procedural Accidents	Describe causes, prevention and treatment of procedural accidents during: - Access cavity preparation; - Cleaning and shaping; - Obturation. Describe the following errors including their management: - Transportation; - Ledging; - Elbow; - Zipping; - Root perforations- apical, middle and coronal; - Separated instruments; - Aspiration and ingestion; - Hypochlorite accident; - Air Emphysema. Identify on clinical and/or radiographic slides various procedural errors. Discuss how procedural errors can affect the prognosis of treatment.

S.NO	TOPIC	TOPIC OBJECTIVES
15	Endodontic Emergencies	Identify causes of endodontic emergencies: pre-treatment, inter-appointment and post-obturation. Discuss the difficulties in diagnosing and treating a patient presenting with an endodontic emergency. Explain the importance of sequential approach to endodontic emergencies. Describe how to manage various endodontic emergencies including: - Painful irreversible pulpitis; - Necrotic pulp with acute apical periodontitis; - Acute apical abscess; - Acute apical periodontitis. Identify inter-appointment and post-obturation flareup. Discuss management of inter-appointment and post-obturation flareup. Discuss pharmacological therapy used in emergency and its role in controlling pain and infection. List indications and contraindications for prescribing analgesics, antibiotics, anti-inflammatory agents and anxiolytics. Develop a treatment plan consisting of appropriate endodontic and pharmacologic strategies for managing pain, anxiety, and infection. Write down a prescription for pain and infection control in patients presenting with endodontic pain.
16	Restoration of Endodontically Treated Tooth	Differentiate endodontically treated teeth from vital teeth. Explain the importance of coronal seal. Discuss options available for restoring endodontically treated teeth. Explain ferrule effect. Describe indications of post placement in anterior and posterior teeth. Describe Nayyar Core. Describe ideal dimensions of a post. Describe common post systems, their advantages and disadvantages. Describe method of placement of prefabricated and cast post. Describe core materials and their placement. Discuss complications that can occur during placement of post.
17	Endodontic Considerations in Geriatric Patients	Describe changes in pulp morphology with age. Discuss special considerations when planning treatment for geriatric patients. Discuss management of the difficulties that can be encountered during root canal treatment of older patients.

S.NO	TOPIC	TOPIC OBJECTIVES
18	Nonsurgical Endodontic Retreatment	Explain rationale and indications of endodontic retreatment. Describe the alternates to endodontic retreatment. Discuss technique of accessing through extra coronal restorations. Describe technique of removing crowns and posts. Discuss various types of canal obstructions and their management. Describe the techniques for gutta percha removal. Explain the role of intra-canal medicament in retreatment. Justify prognosis of retreatment.
19	Endodontic Surgery	Justify the need of endodontic surgery alone or in combination with nonsurgical root canal therapy. Describe situations when endodontic surgery is contraindicated. Define the terms: - Incision for drainage; - Apical curettage; - Root-end resection; - Root-end preparation; - Root-end filling; - Root amputation; - Hemisection; - Bicuspidization. Discuss indications and the steps involved for the above mentioned procedures. Explain principles of flap design. Discuss various flap designs. Describe in brief, step by step procedures involved in peri-radicular surgery. Discuss prognosis of endodontic surgical cases.
20	Longitudinal Tooth Fractures	Differentiate among the following: - Craze line; - Cusp fracture; - Cracked tooth; - Split tooth; - Vertical root fracture. Describe the causes of these fractures of tooth structure. Describe symptoms and clinical features of these fractures of tooth structure. Diagnose longitudinal tooth fractures in patients based on history, clinical and radiographic examination. Discuss the treatment, prognosis and prevention of a crack/ fracture at various levels.

S.NO	TOPIC	TOPIC OBJECTIVES
21	Endodontic and Periodontal Inter Relationship	Classify endodontic-periodontal lesions. Discuss possible paths of communication between pulpal and periodontal tissue. Differentiate between lesions of endodontic or periodontal origin based on clinical, radiographic and histopathological features. Justify treatment options.

COURSE TOPIC: DISORDERS OF FLUID and HEMODYNAMICS

S.NO	TOPIC	TOPIC OBJECTIVES
1	Introduction to Paediatric Dentistry	Discuss growth and development of jaws and dentition. Differentiate between permanent and primary teeth. Discuss the chronology of development of primary and permanent dentition. Discuss eruption timing and sequence of primary and permanent teeth.
2	Pain and Anxiety Management of Paediatric Patient	List various pharmacological methods of pain and anxiety control in paediatric patients. Discuss different behavioral management strategies for paediatric patients. Describe different sedation techniques for paediatric patients. Discuss the dental management of children with special needs. Demonstrate various behavioral management strategies on simulated paediatric patients. Write down a prescription for pain and infection control in paediatric patients presenting with endodontic pain.
3	Prevention of Dental Disease of Paediatric Patient	Take a dental and dental history of a paediatric patient. Describe various dental conditions that may affect the management of paediatric patient. Discuss effects of diet on dental tissues. Describe various sources of sugars. Discuss the effect of fluoride on dental caries process. Explain the rationale for fluoride supplementation. Describe different vehicles of fluoride delivery. Describe correct tooth brushing technique. Explain the importance of parental counseling. Describe the importance of dietary management and home care in caries prevention.

S.NO	TOPIC	TOPIC OBJECTIVES
		Discuss the importance of regular dental follow-ups. Counsel parent/ guardian of a paediatric patient regarding measures to prevent dental disease. Describe the importance of fissure sealing and acid etch technique as a preventive measure. Describe the placement of pit and fissure sealants and preventive resin restorations in primary teeth. Perform placement of pit and fissure sealants and preventive resin restorations on patients.
4	Local Anaesthesia Technique for Paediatric Patient	Describe available topical anaesthesia solutions. Describe new techniques for achieving topical anaesthesia . List various techniques of local anaesthesia administration. Describe pain free anaesthesia technique. Discuss possible complications of local anaesthesia . Perform painless anaesthesia technique on paediatric patients undergoing restorative treatment.
5	Restorative Dentistry for Paediatric Dentition	Discuss methods to detect and diagnose dental caries in primary teeth. Describe the pattern of early childhood caries and its management. Discuss the radiographic views that are of value in diagnosing dental caries. Diagnose dental caries in primary teeth based on clinical and radiographic examination. Explain the importance of isolation when restoring teeth. Explain the importance of matricing in proximal decay. Discuss restorative materials that can be used to restore a carious lesion. Describe restoration of occlusal and proximal caries. Perform restoration of primary teeth. Describe the indications for stainless steel crowns and acrylic crowns. Describe the technique for stainless steel crown and acrylic crown placement.
6	Pulp Therapy for Primary and Young Permanent Teeth	Describe the development of a tooth from its eruption to root maturation. Explain the need to save a primary tooth. Describe the importance of case assessment. Describe the indications and contraindications of pulp therapy in deciduous teeth. Describe the stabilization of mouth in case of rampant caries. Describe the indications, contraindications and procedures in primary dentition for: - Pulp cap; - Pulpotomy; - Pulpectomy.

S.NO	TOPIC	TOPIC OBJECTIVES
		Describe the development of a tooth from its eruption to root Describe indications, contraindications and procedure in young permanent dentition for: - Indirect pulp cap; - Direct pulp cap; - Cvek pulpotomy; - Apexogenesis; - Apexification. Discuss the role of regenerative endodontics in the management of non-vital immature teeth. Perform indirect pulp cap procedure on primary and young permanent teeth.
7	Inherited Anomalies Of Enamel And Dentin	List various inherited enamel and dentin defects. Discuss the clinical problems associated and treatment objectives when managing inherited enamel and dentin defects. Discuss the etiology, prevention, clinical features and management of: - Amelogenesis Imperfecta; - Dentinogenesis Imperfecta; - Molar Incisor hypoplasia. Diagnose based on history, clinical and radiographic examination: - Amelogenesis Imperfecta; - Dentinogenesis Imperfecta; - Molar Incisor hypoplasia.
8	Periodontal Diseases in Paediatric Patient	Classify periodontal diseases in children. Discuss the etiology, clinical features and management of acute gingival conditions: - Primary herpetic gingivostomatitis; - Necrotizing ulcerative gingivitis. Discuss the etiology, clinical features and management of chronic gingivitis and periodontitis. Discuss etiology, clinical features and management of drug induced gingival enlargement. Discuss periodontal disease as a manifestation of various syndromes and systemic diseases in children.
9	Anomalies of Tooth Formation and Eruption	Discuss the prevalence, etiology and management of variation in number of teeth. Discuss various anomalies in tooth size and their management. Discuss various anomalies of tooth form and their management. Describe disturbances in eruption and exfoliation and its clinical significance. Diagnose anomalies of tooth size and form based on clinical and radiographic examination. Diagnose disturbances in eruption and exfoliation based on history, clinical and radiographic examination.

S.NO	TOPIC	TOPIC OBJECTIVES
10	The Pedodontic-Orthodontic Interface	Discuss the importance of screening patients for orthodontic referral at the correct time. Formulate a referral letter to an orthodontist when required. Define interceptive orthodontics. Discuss the rationale and sequence of serial extractions. Discuss various space maintainers used in mixed dentition. Describe various habit breaking appliances in paediatric patients.
11	Oral Surgery and Pathology in Paediatric Patients	Discuss lesions affecting the oral soft tissues in children: - Infections; - Ulcers; - Vesiculobullous; - White lesions; - Cysts; - Tumors. Discuss lesions affecting the jaws in children: - Cysts; - Developmental; - Osteodystrophies; - Tumors.
12	History and Examination of Patient with Dental Trauma	Classify dento-alveolar injuries. Take dental and dental history of a patient presenting with history of dental trauma. Perform thorough extraoral and intraoral examination of patient presenting with history of dental trauma. Discuss the appropriate radiographs needed for an accurate diagnosis.
13	Injury to Tooth and Healing After Trauma	Describe different types of healings. Describe the healing of pulp and factors affecting its healing. Describe the healing of periodontium and factors affecting its healing Differentiate between various types of root resorptions: - External resorption; - Cervical resorption; - Internal resorption; - Replacement resorption.

S.NO	TOPIC	TOPIC OBJECTIVES
14	Injuries to Primary Dentition	Describe management of hard tissue injury in the following categories: - Uncomplicated crown fracture; - Complicated crown fracture; - Crown-root fracture; - Root fracture. Describe management of soft tissue injury in following categories: - Concussion; - Subluxation; - Extrusive luxation; - Lateral luxation; - Intrusion; - Avulsion. Describe the sequelae of injuries to the primary dentition.
15	Injury to Permanent Dentition-Hard Tissue	Describe management of hard tissue injury in the following categories: - Enamel infarction; - Enamel fracture; - Enamel-dentin fracture; - Complicated crown fracture; - Uncomplicated crown-root fracture; - Complicated crown-root fracture; - Root fracture. Discuss the types and uses of splints. Describe the duration of splint therapy in each injury. Describe the procedure for placement of composite and wire splint.
16	Injury to Permanent Dentition-Luxation and Avulsion	Describe management of soft tissue injury in following categories: - Concussion; - Subluxation; - Extrusive luxation; - Lateral luxation; - Intrusion; - Avulsion. Describe duration of splint therapy in each injury. Describe the rationale of delayed reimplantation of an avulsed tooth.

COURSE TOPIC: INDIRECT RESTORATIONS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Review of Restorative Materials	Discuss the composition, properties, merits and shortcomings of materials used for indirect restorations: - Metals; - Ceramics.
2	Partial Coverage Indirect Restorations	List: - Various partial and full coverage indirect restorations; - Materials available for fabrication of these restorations; - Materials that are used for cementation. Describe the principles of tooth preparation for indirect restorations. Describe the indications and contraindications for provision of: - Inlay, - Onlay. Describe the clinical assessment required and the steps of preparation for: - Inlay; - Onlay. Discuss soft tissue management and impression making for inlays and onlays. Discuss laboratory steps for these restorations. Describe the clinical procedure for cementation. Discuss the latest innovations including CAD-CAM technology.
3	Porcelain Veneers	Discuss indications and contraindications for veneers. Describe the diagnostic procedures involved in treatment planning. Justify the importance of quality and quantity of enamel for predictable bonding. Describe tooth preparation, soft tissue management and impression making for veneers. Describe methods of temporization. Describe step by step procedure of veneer placement. Explain the importance of silane coupling agent and hydro fluoric acid. Describe techniques for intra oral repair of indirect restorations.

S.NO	TOPIC	LEARNING OBJECTIVES
4	Full Coverage Indirect Restorations	Describe the indications and contraindications for: - Porcelain jacket crown; - Porcelain fused to metal crown; - All metal crown; - All ceramic crown. Discuss factors influencing shade selection. Describe guidelines for accurate shade matching and various methods of shade selection. Describe the clinical assessment required and the steps of preparation for: - Porcelain jacket crown; - Porcelain fused to metal crown; - All metal crown; - All ceramic crown. List materials available for these restorations and the cements used for cementation. Discuss soft tissue management and impression making for full coverage restorations. Discuss the indications, contra indications and technique for the use of electrosurgery. Discuss laboratory steps for these restorations. Describe the clinical procedure for cementation. Discuss the latest innovations including CAD-CAM technology.
5	Implant Supported Restorations	Discuss indications and contraindications of implant supported restorations. Describe various implant supported restorations that can be used for replacement of missing teeth.

ORAL SURGERY

COURSE TOPIC: BASIC PRINCIPLES OF ORAL SURGERY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Introduction. History, Diagnosis and Treatment Planning	Formulate a treatment plan for the patient presenting in oral surgery on the basis of history, clinical examination and radiograph. Explain Basic necessities for surgery. Define Aseptic technique. Perform aseptic technique on patients during surgery. Discuss communicable pathogenic organisms: - Bacteria; - Viral organisms; - Mycobacterial organism.
2	Sterilization. (Instruments and armamentarium).	Discuss: - Aseptic techniques and universal precautions; - Techniques of instrument sterilization and disinfection; - Maintenance of sterility; - Operating disinfection; - Surgical staff Preparation. Explain post-surgical Asepsis.
3	Incision. Flap design and tissue handling	Demonstrate: - Incisions; - Flap design; - Prevention of flap necrosis, flap dehiscence, and flap tearing.
4	Haemostasis management and suturing	Describe tissue handling. Describe hemostasis and means of promoting wound hemostasis. Discuss dead space management.
5	Post-operative care, nutrition, prevention of infection	Describe: - Decontamination and debridement; - Edema control; - Patient general health and nutrition.
6	Wound healing (soft tissue and hard tissue)	List causes of tissue damage. Discuss wound repair and epithelialization. List stages of wound healing. Discus surgical significance of wound healing concepts. Define facial neuropathy of traumatic origin. List the classifications of nerve injury. Discuss nerve healing.

COURSE TOPIC: dental ASPECTS OF ORAL SURGERY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Prevention and Management of dental Emergencies	**Take a** comprehensive dental history of patients presenting to the dental OPD. **Demonstrate** physical examination on patients presenting in the OPD. **Discuss** conditions which can exaggerate the pre-existing dental conditions. **Discuss** appropriate preventive measures to be taken before treatment.
2	Management of dentally Compromised Patient	**Diagnose** dental problems in dentally compromised patient. **Obtain** informed /written consent. **Discuss** management of patient with compromising dental condition. **Prescribe** medication for pregnant and postpartum patients after treatment.

COURSE TOPIC: ANESTHESIA AND SEDATION

S.NO	TOPIC	LEARNING OBJECTIVES
1	Introduction and types of anaesthesia	Classify Anaesthesia . Describe different type of anesthetic solutions used in dentistry.
2	Preoperative assessment	Interpret investigations for General Anaesthesia fitness. Discuss criteria for selecting patient to undergo procedures under general anaesthesia . Describe Mechanism of local anaesthesia .
3	Indication and contraindications	Discuss indications and contraindications of general local anaesthesia and local anaesthesia .
4	Administration and techniques	Explain conventional and specialized technique of local anaesthesia administration. Administer local anaesthesia with the most suitable technique in different clinical scenarios.

COURSE TOPIC: EXODONTIA

S.NO	TOPIC	LEARNING OBJECTIVES
1	Clinical and radiographic evaluation of teeth for removal	Discuss the following steps as a prerequisite for tooth extraction:0 - Pain and anxiety control; - Pre-surgical dental assessment; - Clinical evaluation of teeth for removal; - Radiographic examination of tooth for removal; - Patients and surgeon's preparation.
2	Principles of use of instruments	Identify instruments used for: - incising tissue; - elevating mucoperiosteum; - retracting soft tissue; - controlling hemorrhage; - grasping tissue; - removing bone; - removing soft tissue from bony defects; - suturing mucosa; - holding mouth open; - providing suction; - transferring sterile instruments; - holding towel and drapes in position; - Irrigation. Demonstrate correct use of: - Dental elevators; - Extraction forceps. Discuss instrument tray system.
3	Non-surgical extraction	Discuss: - Indications and contraindications for removal of teeth; - Mechanical principles involved in tooth extractions; - Principles of forceps use; - Specific techniques for removal of each tooth; - Post extraction care of tooth socket. Demonstrate: - Correct chair position for forceps extraction; - Procedure of closed extraction.
4	Surgical extraction	Discuss: - Principles of flap design, development and management; - Design parameters for soft tissue flaps; - Types of mucoperiosteal flaps; - Principles of suturing; - Indications, principles and techniques for surgical extraction. Demonstrate: - Technique for open extraction of single- rooted tooth; - Technique for surgical removal of multi rooted teeth; - Removal of small root fragments and root tips.

S.NO	TOPIC	LEARNING OBJECTIVES
		Discuss Policy for leaving root fragments. Formulate a treatment plan emphasizing on extraction sequencing and technique for extraction when multiple extractions have to be performed.

COURSE TOPIC: IMPACTED TEETH

S.NO	TOPIC	LEARNING OBJECTIVES
1	Definition, assessment and evaluation of impacted teeth	Define Impaction. Classify impactions. Classify maxillary impacted teeth according to modified classification. Discuss the indications and contraindications for removal of impacted teeth. Describe the difficulty of removal of impacted teeth. Discuss preoperative and postoperative patient management after extraction. Discuss intra-operative complications: - Injuries to the adjacent teeth, osseous and adjacent structures and soft tissue injuries. Discuss Root Morphology. Describe the surgical procedures for extraction. Discuss measures of control of postoperative bleeding, pain and discomfort. Write down operative notes for patient records. Discuss measures to prevent post-operative complications: - oro-antral communications; - postoperative bleeding; - delayed healing and infection; - Fractures of the mandible.
2	Indications, contraindications and type of impactions	
3	Techniques of removal	
4	Post-operative management and complications	

COURSE TOPIC: INFECTIONS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Acute infection	Classify spaces of infection. Explain: - Microbiology of odontogenic infections; - Fascial space infections; - Mandibular spaces; - Osteomyelitis; - Actinomycosis; - Candidosis.
2	Chronic infection	
3	Spread of infection	Discuss natural history of progression of odontogenic infections.
4	Principles of management of infection	Discuss principles of: - Therapy of odontogenic infections; - Prevention of infection; - Prophylaxis of wound infection; - Prophylaxis against metastatic infection.

COURSE TOPIC: CYSTS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Diagnosis and management of cysts	Discuss basic surgical goals. Describe surgical management of cysts and cyst like lesions of the jaws.

COURSE TOPIC: ODONTOGENIC TUMOUR

S.NO	TOPIC	LEARNING OBJECTIVES
1	Diagnosis and management	Identify Odontogenic tumors on patients. Describe surgical management of benign lesions in oral soft tissues. Discuss principles of surgical management of jaw tumors.
2	Resection	Discuss resections types and their indications in the jaw tumor. Explain reconstruction of jaws after removal of oral tumors.

COURSE TOPIC: MALIGNANT OROFACIAL TUMOUR

S.NO	TOPIC	LEARNING OBJECTIVES
1	Clinical features, investigation and diagnosis of cancer	Discuss Principles of surgical management of jaw tumors.
2	Principles of differential diagnosis and biopsy	Discuss examination and diagnostic methods. List principles of biopsy. Discuss: - Soft tissue biopsy technique and surgical principles; - Intraosseous/ hard tissue biopsy technique and surgical principles. Formulate a referral letter for biopsies if needed.
3	Management (surgery, radiotherapy and chemotherapy)	Describe dental management of patients: - undergoing radiotherapy to head and neck; - On systemic chemotherapy for malignant disease.
4	Reconstruction principles	Classify the mucosal flaps use for reconstruction. Describe basic reconstructive principles.

COURSE TOPIC: SALIVARY GLAND DISEASE

S.NO	TOPIC	LEARNING OBJECTIVES
1	Salivary gland infection, obstructive disease and tumors	Discuss: - Embryology, anatomy and physiology of salivary glands; - Diagnostic modalities for salivary gland diseases; - Obstructive salivary gland disease; - Mucous retention and extravasation phenomenon; - Salivary gland infections; - Necrotizing sialometaplasia; - Sjogren's syndrome; - Traumatic salivary gland injuries; - Salivary gland disorders.
2	Clinical features, investigation and management of salivary gland disorders	

COURSE TOPIC: TMJ DISORDERS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Classification of TMJ disorders	Classify temporomandibular disorders.
2	Clinical features, investigation and treatment modalities	Identify sign and symptoms of TMJ disorders. Evaluate a patient with TMJ disorder. Formulate a management plan for patient presenting with TMJ disorders. Prescribe relevant investigation. Discuss: - Different treatment options; - Permanent occlusion modification; - Temporomandibular joint surgery; - Follow up.

COURSE TOPIC: PRE-PROSTHETIC SURGERY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Correction of soft and hard tissue abnormities	Discuss the following: - Objectives of pre-prosthetic surgery; - Principles of patient evaluation and treatment planning; - Re-contouring the alveolar ridges; - Tori removal; - Soft tissue abnormalities; - Immediate dentures; - Overdenture surgery; - Mandibular augmentation; - Maxillary augmentation; - Soft tissue surgery for ridge extension of the mandible; - Soft tissue surgery for maxillary ridge extension; - Correction of abnormal ridge relationships.
2	Dental implants	Discuss: - Biologic considerations for osseointegration; - Clinical implant components; - Implant prosthetic options; - Preoperative dental evaluation of implant patient; - Surgical phase: treatment planning; - Basic surgical techniques; - Complications; - Advanced surgical techniques; - Special situations.

COURSE TOPIC: FACIAL PAIN

S.NO	TOPIC	LEARNING OBJECTIVES
1	Diagnosis and management of Orofacial pain	Classify orofacial pains. Discuss the following: - Basics of pain neurophysiology - Neuropathic facial pains - Chronic headache - Chronic head pains of dental interest Evaluate patients presenting to the dental OPD with orofacial pain.
2	Clinical evaluation and management of trigeminal neuralgia	Discuss the signs and symptoms, clinical history and management options of trigeminal neuralgia.

COURSE TOPIC: ORO-FACIALNEUROPATHIES

S.NO	TOPIC	LEARNING OBJECTIVES
1	Diagnosis and management of facial palsy	Discuss the causes and management of facial nerve pathology.

COURSE TOPIC: CLEFT LIP AND PALATE

S.NO	TOPIC	LEARNING OBJECTIVES
1	Management of cleft lip and palate patient	Discuss the embryology, causative factors and problems of the cleft affected individual. Discuss treatment and dental needs of cleft lip and palates.

COURSE TOPIC: ORTHOGNATHIC SURGERY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Objectives and principles of management of Orthogenetic surgery	Classify orthognathic procedures. Evaluate patient for orthognathic surgery. Discuss the procedure to correct jaw abnormality.

COURSE TOPIC: SURGICAL ENDODONTICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Indication and Technique (Surgical Endodontics)	Discuss the following: - Drainage of abscess; - Periapical surgery; - Corrective surgery; - Healing; - Recall; - Adjuncts; - When to consider referral.

COURSE TOPIC: MAXILLOFACIAL TRAUMA

S.NO	TOPIC	LEARNING OBJECTIVES
1	BLS and ATLS	Discuss evaluation of patients with facial trauma. Demonstrate Basic Life Support (BLS) and Advanced Trauma Life Support (ATLS). Discuss ABCDE of emergency management.
2	Traumatic injuries of teeth	Discuss: - Soft tissue injuries; - Dentoalveolar injuries.
3	Management of soft tissue injuries	
4	Management of mandibular fractures	Classify mandibular fractures. Discuss causes, sign and symptoms and management of mandibular fractures. Explain complications of mandibular fracture.
5	Clinical features, investigation and manage of ZMC	Classify Zygomatic maxillary Complex (ZMC) fractures. Discuss causes, signs, symptoms and management of ZMC fractures. Discuss appropriate investigations for ZMC fracture. Explain complication of ZMC fracture.
6	Nasal and Orbital fractures.	Discuss anatomy of orbit. Classify Orbital and Nasal fractures. Discuss causes, signs, symptoms and management of orbital and nasal fractures. Explain complication of orbital and nasal fracture.
7	Mid face fracture.	Classify Mid-face fractures. Discuss causes, signs, symptoms and management of mid face fractures. Explain complication of mid face fracture.

PROSTHODONTICS

COURSE TOPIC: REMOVABLE PARTIAL DENTURES

S.NO	TOPIC	LEARNING OBJECTIVES
1	Partially edentulous epidemiology, physiology and terminology	Define the following: - Abutment; - Retainer; - Extra coronal partial denture; - tooth supported Removable Partial Denture(RPD); - tooth tissue supported RPD; - temporary RPD; - Interim denture; - Transitional denture; - Treatment denture;
2	Applied anatomy and physiology	- Centric relation; - Centric occlusion; - Eccentric relation; - Support; - Retention; - Reciprocation; - Bracing; - Appliance; - Saddle area; - Stability. Discuss the Clinical application of anatomy of oral cavity.
3	Classification of partially edentulous arches.	Discuss the requirements of an acceptable method of classification. Discuss the following: - Bailyn classification; - Skinner classification; - Cummer classification; - Kennedy classification; - Applegate's rules.
4	Oral manifestations of local and systemic diseases	Discuss the problems related to: - Xerostomia; - Poor healing; - Osteoporosis; - Osteopenia; - Autoimmune diseases.

S.NO	TOPIC	LEARNING OBJECTIVES
5	Diagnosis and treatment planning. Patient Evaluation, history, general examination and Problem Oriented Treatment Planning.	Perform the Clinical examination. Take a complete history from patients coming to OPD. Perform the following examination of patient: - General Examination (gait, complexion and personality, cosmetic index, mental attitude of patient); - Extra Oral examination (facial features, facial form, facial profile, lower facial height, muscle tone, complexion, lip competency); - TMJ examination (including muscles of mastication, deviation, deflection, clicking/crepitation of TMJ and mouth opening); - Neuromuscular examination; - Intra Oral Examination (Hard and soft tissues, saliva, occlusion); - Radiographic examination (crown to root ratio, periapical pathology, retained residual roots, thickness of mucosa, bone support and quality, root configuration of abutment teeth). Discuss the following: - Purpose of diagnostic cast; - Mounting diagnostic cast; - Sequence of mounting maxillary cast to axis orbital plane; - Jaw relation for diagnostic cast; - Materials and methods for centric relation. Interpret the diagnostic findings. Interpret examination data: - Radiographic interpretation; - Periodontal consideration; - Caries cavity; - Evaluation of prosthesis foundation teeth and residual ridge; - Surgical preparation; - Analysis of occlusal factors; - Fixed restorations; - Orthodontic treatment. Discuss the following: - Indications of fixed and removable partial denture; - Choices between complete denture and removable partial denture; - Clinical factors related to metal alloys used for metal framework.
6	Biomechanics of removable partial dentures	Discuss the bio mechanical consideration. Discuss the concept of Lever 1, 2 and 3. Discuss vertical, horizontal and torsional stress considerations in partial dentures. Discuss: - Factors influencing magnitude of stress; - Differential support; - Role of periodontal ligaments in removable partial denture.

S.NO	TOPIC	LEARNING OBJECTIVES
7	Connectors (major and minor connectors)	Define major and minor connectors. Discuss the location, types, function, indications and contraindication, design and ideal requirements of minor and major connectors. Discuss Tissue stops and finishing lines.
8	Rests and Rest Seats	Define rests and rest seats. Discuss types, form, supports, design and role of rest and rest seats in control of prosthesis movement.
9	Direct retainers	Define direct retainers. Discuss role of direct retainer in prosthesis movement control. Classify extra coronal and intra coronal direct retainers. Discuss: - Analysis of tooth contours for retentive clasps; - Functional requirement of clasp. Justify the choice of selecting a certain clasp design. List basic parts of clasp assembly. Discuss: - Basic principles of clasp design; - Types of clasp assemblies; - Other type of retainers.
10	Indirect retainers	Define Indirect retainers. Discuss: - Factors influencing effectiveness of indirect retainer; - Forces acting on the denture; - Fulcrum line; - Auxiliary functions of indirect retainers; - Rugae support. Discuss various indirect retainers: - Auxiliary occlusal rests; - Canine rests; - Canine extension from occlusal rests; - Cingulum bars (continuous bars) andlinguoplates; - Modification areas.

S.NO	TOPIC	LEARNING OBJECTIVES
11	Denture base considerations	Define denture base. Discuss ideal requirement, functions and methods of attaching for a denture base. Discuss denture base material, their advantages and disadvantages. Describe methods of attaching artificial teeth: - Porcelain or acrylic resin teeth attached with acrylic resin; - Porcelain or resin tube teeth and facings cemented directly to metal bases; - Resin teeth processed directly to metal bases; - Metal teeth; - Chemical bonding. Discuss the need for relining and stress breakers.
12	Principles of removable partial denture design	Discuss difference in prosthesis support and the influence on design. Differentiation between two main types of removable partial denture according to their support, impression registration and clasp designs. Describe essentials and components of partial denture design. - Tooth support; - Ridge support; - Major and minor connectors; - Direct retainer for tooth supported partial denture; - Direct retainer for distal extension partial denture; - Stabilizing components; - Guiding plane; - Indirect retainers. Design: - Class I removable partial denture; - Kennedy class II removable partial denture; - Kennedy class III removable partial denture; - Kennedy class IV partial denture.
13	Surveying	Define surveying. Discuss types, parts and purpose of dental surveyor. Describe various types of survey lines. Discuss factors that determine path of placement and removal. Discuss step by step procedures in surveying a diagnostic cast.

S.NO	TOPIC	LEARNING OBJECTIVES
14	Preparation of mouth for removable partial dentures	Discuss the following Oral surgical procedures: - Extractions; - Removal of residual roots, impacted and malposed teeth; - Cysts and odontogenic tumors; - Exostoses and tori; - Hyperplasic tissue; - Muscle attachments and frena; - Bony spines and knife edge ridges; - Polyps, papillomas and traumatic hemangiomas; - Hyperkeratosis, erythro plasia and ulceration; - Dentofacial deformity; - Osseo integrated devices; - Augmentation of alveolar bone; - Conditioning and use of tissue conditioning materials; - Periodontal preparations; - Periodontal diagnosis and treatment planning; - Initial disease control therapy; - Definitive periodontal surgery; - Recall maintenance. Discuss occlusal disharmony, pain, discomfort and endodontic treatment.
15	Preparation of abutment teeth.	Classify abutment teeth. Discuss the following: - Sequence of abutment preparation on sound teeth and existing restorations; - Preparation of guide planes; - Preparation of rest seats; - Technique to create undercut; - Abutment preparation using crowns; - Abutment preparation using conservative restoration; - Splinting of abutment teeth; - Use of isolated teeth as abutments; - Missing anterior teeth; - Temporary crowns when a removable partial denture is being worn.
16	Impression techniques and modification	Discuss: - Types of impression materials used for RPD; - Anatomic or functional form of impression; - Indication of functional impression. Discuss the following impression techniques: - Mclean's physiologic impression technique; - Functional relining method; - Selective pressure impression; - Altered cast technique; - Modifications of altered cast technique.

S.NO	TOPIC	LEARNING OBJECTIVES
17	Trial of metal framework	Discuss examination of the framework. Discuss steps of fitting frame work to teeth, supporting structures and opposite occlusion. Describe correction of discrepancies by indicating media and soft tissue impingements and finishing the framework.
18	Occlusal relations for removable partial denture. (Maxillo-mandibular relations)	Discuss the following: - Desirable occlusal contact relationship for removable partial denture. - Methods for establishing occlusal relationship; - Use of face bow; - Use of articulators; - Articulation techniques including split cast technique; - Establishing jaw relations for mandibular removable partial denture opposing a maxillary complete denture.
19	Selection of teeth	Discuss anterior teeth selection according to size, form and colour of teeth on the basis of various patient factors. Discuss posterior teeth selection on the basis of size and form of teeth by taking the following into considerations: - Condylar inclination; - Height of residual ridge; - Patients age; - Ridge relationship.
20	Laboratory procedures. 1.Construction of wax pattern and casting procedures 2. Arrangement of teeth. 3. Processing and finishing denture.	Demonstrate the procedure of - Duplicating a stone cast; - Waxing the removable partial denture framework; - Spruing, investing, burnout, casting, removing the casting from investment and finishing; - Making record bases; - Making a stone occlusal template from a functional occlusal record. - Arranging anterior and posterior teeth; - Characterization of teeth; - Waxing and flasking the removable partial denture before processing acrylic resin bases; - Processing the denture; - Remounting the denture for occlusal correction; - Polishing the denture. Discuss duplicating materials, flasks and duplicating procedures.

S.NO	TOPIC	LEARNING OBJECTIVES
21	Insertion and post insertion instructions and recall.	Discuss: - Adjustment to denture bearing area; - Occlusal interferences from denture framework; - Evaluation of occlusal interferences; - Adjustment of occlusion in natural and artificial dentition; Demonstrate insertion of RPD Give Instructions to the patient pertinent to RPD insertion; Address post-insertion complaints in follow up visits.
22	Types of partial denture 1. Interim partial denture 2. Every denture 3. Spoon denture 4. Swing lock denture	Demonstrate for all types of partial dentures: - Impression making; - Laboratory procedure; - Insertion; Address post-insertion complaints in follow up visits.

COURSE TOPIC: COMPLETE DENTURE

S.NO	TOPIC	LEARNING OBJECTIVES
1	Definitions	Define the following terms: - Conventional; - Immediate; - Overdenture; - Single complete denture; - Implant supported CD.
2	Applied anatomy and physiology of complete denture	Discuss extra-oral landmarks of prosthetic importance - Inter-pupillary line; - Ala-tragus line; - Canthus-tragus line; - Nasolabial sulcus; - Vermillion border; - Philtrum; - Modiolous; - Angle of the mouth.

S.NO	TOPIC	LEARNING OBJECTIVES
		Discuss intra-oral landmarks of prosthetic importance in Maxilla: - Residual ridge; - Maxillary tuberosity; - Palate; - Mid-palatine raphae; - Incisive papilla; - Palatine rugae; - Torus palatinus; - Fovea palatinae; - Post palatal seal; - Hamular notch; - Cuspid eminence; - Zygomatic process. Discuss intra-oral landmarks of prosthetic importance Mandible: - Residual ridge; - External oblique ridge; - Buccal shelf area; - Mental foramen; - Retromolar pad area; - Mylohyoid ridge; - Torus mandibularis; - Internal oblique ridge; - Genial tubercle.
3	Peripheral tissue attachment of denture bearing area	Discuss the border structures that limit the periphery of the denture in maxilla: - Labial frenum and vestibule; - Buccal frenum and vestibule; - Hamular notch; - Posterior palatal seal; - Muccogingival fold; - Fovea palatinae. Discuss the border structures that limit the periphery of the denture in mandible: - Labial frenum and vestibule; - Buccal frenum and vestibule; - Lingual frenum; - Alveololingual sulcus; - Retromolar pad; - Pterygo mandibular raphae.
4	Tongue Form	Classify tongue form according to House. Describe Selection of occlusion depending on tongue condition: - Tongue position; - Examination of floor of mouth posture; - Tongue biting.

S.NO	TOPIC	LEARNING OBJECTIVES
5	Saliva	Discuss the importance of saliva in complete denture retention - Salivary flow and viscosity; - dental conditions affecting the salivary flow and viscosity; - Xerostomia. Discuss factors contributing to complete denture retention: - Adhesion; - Cohesion; - Interfacial surface tension; - Capillary attraction. Manage patients with altered salivary flow.
6	Systemic disorders and applied pathology	Describe oral-systemic considerations that may influence an adaptive prosthodontic experience: - Mucosal conditions; - Vesiculoerosive; - Oral lichen planus; - Erythema multi forme; - Mucous membrane pemphigus/pemphigoid; - Systemic lupus erythematosus; - Burning mouth syndrome; - Oral movement disorders; - Salivary dysfunction; - Xerostomia; - Sjogren's syndrome; - Diabetes; - Nutrition; - Fungal infection
7	Identification and evaluation of patients	Demonstrate history taking and diagnosis. Take dental and dental history of patients presenting to OPD. Perform clinical examination of patient including: - Extra oral Examination; - Facial examination; - TMJ Examination; - Intraoral Examination; - Residual alveolar ridge classification; - Oral mucosa examination; - Salivary flow (xerostomia); - Inter-arch space; - Bony prominences; - Gag reflex; - Undercuts; - Frenum attachments; - Tongue examination.

S.NO	TOPIC	LEARNING OBJECTIVES
		Formulate a treatment plan for edentulous patients keeping the following in consideration: - Adjunctive Care; - Elimination of infection; - Elimination of pathoses; - Preprosthetic surgery; - Alveoloplasty; - Excision of flabby tissue; - Frenectomy; - Tissue conditioning; - Nutritional counseling.
8	General Conditions	Discuss the impact of edentulism in old age on: - Mucosa; - Bone; - Saliva; - Jaw movements in old age; - Taste and smell sensations; - Nutrition; - Teeth. Discuss functional and parafunctional considerations of occlusion.
9	Muscle tone and muscle development	Discuss the following: - Movements of facial expressions; - Movements of tongue muscles; - Muscles of mastication; - Muscles that move the mandible and floor of the mouth; - Muscles of soft palate; - Muscles and movements of TMJ; - Conditions that affect motor function of muscles (trigeminal neuralgia, Bell's palsy, Hemiplegia and Dyskinesia).
10	Occlusion	Discuss occlusion. Define: - Centric occlusion; - Maximum intercuspation; - Excursive movements; - Working; - Non-working; - Mandibular movements. Draw the Posselt's Envelope of motion Classify various occlusal schemes. Define the following occlusal schemes: - Lingualized Occlusion; - Monoplane occlusion with balance; - Linear occlusion; - Balanced occlusion. Discuss requisites for these occlusal schemes.

S.NO	TOPIC	LEARNING OBJECTIVES
11	Oral lesions with skin manifestations	Discuss various skin conditions with oral manifestations: - Oral erythroplakia; - Drug induced lichenoid reaction; - Oral lichen planus; - Systemic lupus erythematosus; - Reaction to dentifrices and chlorhexidine; - Reaction to smokeless tobacco; - Benign migratory glossitis; - Leukoedema; - White sponge nevus.
12	Psychiatric evaluation of patients	Discuss the psychological needs that are of special importance to all dentists such as: - Personality Types; - The Doctor's behaviour; - Dentist-Patient communication; - Patient satisfaction in prosthetic dentistry.
13	Oral conditions of Denture Bearing Area	Discuss the following oral mucosal conditions associated with denture wearing and their management: - Denture induced stomatitis; - Flabby ridge; - Traumatic ulcer; - Epulisfissuratrum; - Burning mouth syndrome; - Gaging; - Residual ridge resorption; - Denture hyperplasia; - Angular cheilitis; - Frictional Keratosis; - Irritation Fibroma; - Candidiasis; - Chronic atrophic candidiasis; - Inflammatory hyperplasia; - Papillary hyperplasia of palate.
14	Ridge form and ridge relations	Discuss: - Residual ridge configuration given by Atwood; - Parallelism of ridges; - Ridge relations.
15	Oral mucosa: Resistant and Non resistant	Discuss the types and distribution of oral mucous membrane. Describe the mucosal response to oral prosthesis.

S.NO	TOPIC	LEARNING OBJECTIVES
16	Alveolar bone resorption	Discuss the importance of preservation of natural dentition. Describe alveolar bone resorption: - After tooth extraction, - In complete denture wearer, - In patients wearing overdentures. Discuss factors affecting the resorption of residual ridge. Differentiate bone resorption rate in maxilla and mandible. Discuss bone conditions (osteoporosis and arthritis). Describe surgical options for highly resorbed ridges.
17	Face Forms	Classify face forms and facial profiles. Determine lower facial height.
18	Fundamentals of denture retention and contributing factors	Define Retention. Discuss the following factors affecting the retention: - Size and quality of the denture bearing area, ridge walls. - Quality and quantity of saliva; - Adhesion, cohesion, interfacial surface tension, capillarity, atmospheric pressure and gravity; - Undercuts, retentive springs, magnetic forces denture adhesive, suction chamber and discs, palatal implants; - Oral and facial musculature; - Mastication, adhesive food, surrounding musculature, occlusal prematurities and parafunctional habits.
19	Mouth preparation including preprosthetic surgery	Discuss the Nonsurgical methods for mouth preparation. Discuss the following Surgical methods of mouth preparation: - Removal of retained dentition; - Elimination of infections; - Removal of hyperplastic ridge tissue, papillary hyperplasia and hyperplastic epulis fissuratum; - Correction of hypertrophic labial and lingual frenum; - Correction of ridge undercuts, prominent mylohyoid and internal oblique ridges; - Reduction of pandulus maxillary tuberosity and tori; - Vestibuloplasty.

COURSE TOPIC: IMPRESSION PROCEDURES

S.NO	TOPIC	LEARNING OBJECTIVES
1	Objectives of impression	Discuss the following objectives of impression making: - Retention; - Support; - Stability; - Preservation of remaining structures; - Esthetics.
2	Theories and techniques	Discuss theories of impression making: - Minimal-pressure impressions; - Selective-pressure impressions; - Definite-pressure impressions; - Functional impression technique.
3	Impression technique: minimum pressure, definite pressure, selective pressure impression	Discuss the indications, technique, advantages, disadvantages and materials used for following impression techniques: - Minimum pressure; - Definite pressure; - Selective pressure.
4	Pascal's law and its corollaries.	Define Pascal's law. Discuss the procedure and mechanism of evaluation of retention.
5	Impression techniques: primary, wash and secondary impression, impression trays, impression materials	Discuss the Impression techniques based on: - Mouth opening; - Types of trays used; - Theories of impression; - Purpose of impression; - Material used.
6	Stability	Define stability. Discuss the factors affecting stability: - Vertical height of the residual ridge; - Quality of the soft tissue covering the ridge; - Quality of the impression; - Occlusal rims; - Arrangement of teeth; - Contour of the polished surface.

S.NO	TOPIC	LEARNING OBJECTIVES
7	Maxillo mandibular relations	Discuss how to establish the labial form of occlusal rims using: - facial landmarks as a guide; - fullness of upper lip; - Philtrum; - Nasolabial fold; - Commissures of the mouth. Demonstrate how to establish the occlusal plane and maxilla mandibular relations. Classify maxilla mandibular relations on the basis of: - Orientation relations; - Vertical relations; - Resting vertical dimensions; - Occlusal vertical dimension; - Methods of determining vertical relations; - Effects of decreased vertical dimensions; - Effects of increased dimensions; - Horizontal relations; - Centric and eccentric relations; - Method of determining centric relation.
8	Articulators and theories of articulation	Define articulators. Discuss function, types, uses, advantages and disadvantages, purpose and requirements of an articulator. Classify articulators: - Based on the theories of occlusion; - Based on the stability to stimulate jaw movements; - Based on adjustability of the articulators. Discuss protrusive and lateral records. Write down the Hanau's formula.
9	Occlusion	Define occlusion. Describe different types of occlusion: - Balanced occlusion; - Mono plane (non- balance) occlusion; - Lingualized occlusion. Discuss characteristics, importance, general considerations and types of balanced occlusion. Discuss advantages, disadvantages, indications, contraindications of types of occlusion. Describe factors influencing balanced occlusion. Describe compensatory curves: - Curve of Monsoon; - Curve of Spee; - Curve of Wilson.
10	Facebow	Define facebow. Discuss the purpose, use and parts of different types of facebow: - Arbitrary facebow; - Kinematic face bow. Discuss errors in facebow recording. Describe situations where facebow is not required. List the steps for recording the transverse hinge axis.

S.NO	TOPIC	LEARNING OBJECTIVES
11	Teeth selection and arrangement	Discuss the objectives, general considerations, methods in teeth selection. Describe factors that are considered while selecting the size, shape, colour of teeth. Correlate positioning and relationship of teeth in skeletal class I, II, III. Discuss advantages and disadvantages of: - Anatomic teeth; - Non- anatomic teeth; - Cuspless teeth.
12	Try in	Define try in. Evaluate the following during the complete denture try-in: - Denture on articulator; - lip and cheek support; - the occlusal plane; - vertical height; - centric relation; - posterior palatal seal.
13	Insertion	Demonstrate the checking of the fit of the prosthesis at insertion of denture by: - Examining the denture and the patient's mouth; - Checking for adaptation, border extension and frenal relief; - Evaluation the denture aesthetics. Demonstrate the checking of the denture function at insertion appointment by: - Evaluation of retention and stability; - Checking the jaw relation, speech and occlusal harmony; - Checking fitting surface, esthetics and occlusal surfaces; - Checking for any pain, discomfort or ulcers.
14	Post insertion instructions	Demonstrate to patients: - Instruction regarding insertion and removal of the prosthesis; - Maintenance of the prosthesis; - Night wear of the prosthesis; - Periodic recall.
15	Post insertion complains	Demonstrate how to deal with post insertion complains of patients related to: - Fitting surface; - Esthetics; - Occlusal surface; - Pain; - Discomfort; - Mastication problems; - Ulcers.

S.NO	TOPIC	LEARNING OBJECTIVES
16	Immediate dentures and Replacement dentures	Define immediate and replacement dentures. Classify immediate and replacement dentures. Discuss indications and contraindications, objectives, clinical and laboratory procedures for immediate and replacement dentures. Discuss the importance of multidisciplinary approach including care during surgery. Demonstrate the Insertion, follow up and maintenance of immediate dentures.
17	Single complete denture	Define single complete denture. Discuss the following: - Problems with single complete denture; - Common occlusal disharmonies and ways to adjust them; - Single complete denture opposing natural teeth; - Single complete denture opposing; - Implant supported prosthesis; - Methods to achieve balanced occlusion; - Clinical procedure of making single complete denture; - Occlusal materials for single complete dentures.
18	Combination syndrome	Define combination syndrome. Discuss the diagnosis, etiology and treatment strategies for combination syndrome.
19	Speech consideration with Complete denture	Discuss the following for a complete denture: - Bilabial sounds; - Labiodental sounds; - Linguoalveolar sounds; - Liguodental sounds; - Velar sounds.
20	Relining, rebasing, repair and copy denture	Discuss the indications and contraindications, principles and procedure for relining, rebasing, repair and copy denture.

COURSE TOPIC: FIXED PROSTHODONTICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	An introduction to fixed Prosthodontics	Define the following terms: - Fixed prosthodontics; - Crown; - Bridge; - Inlay; - Onlay; - Laminated veneers; - Partial veneer crown; - Full veneer crown; - Retainers; - Connectors; - Pontics; - Abutment; - Saddle area. Discuss the applied anatomy and physiology for: - Temporomandibular joint; - Musles of mastication; - Posselt envelop of motion; - Dentition.
2	History and examination	Take a complete history from patients coming to OPD. Perform the following examination of patient: - General Examination (gait, complexion and personality, cosmetic index, mental attitude of patient); - Extra Oral examination (facial features, facial form, facial profile, lower facial height, muscle tone, complexion, lip competency); - TMJ examination (including muscles of mastication, deviation, deflection, clicking/crepitation of TMJ and mouth opening); - Neuromuscular examination; - Intra oral examination (Hard and soft tissues, saliva, occlusion); - Radiographic examination (crown to root ratio, periapical pathology, retained residual roots, thickness of mucosa, bone support and quality, root configuration of abutment teeth); - Cast Examination (lingual and palatal surfaces of all teeth, size of saddle area, centric relation, wear facets).

S.NO	TOPIC	LEARNING OBJECTIVES
3	Diagnosis and treatment planning ;	Discuss the differential Diagnosis based on Kennedy Class I, II and III with modifications or Kennedy class IV. Formulate a treatment plan based on following adjunctive care: - Elective endodontic procedure; - Crown lengthening procedure; - Restorations; - Correction of occlusal plane; - Scaling and root planning. Discuss the following treatment options: - Full veneer Crown; - Bridge; - Inlay; - Onlay; - Laminated veneers; - Partial Veneer crown (three quarter, seventh eigth, proximal half crown, reverse three quarter crown).
4	Biomechanics of oral cavity and contributory factors	Discuss the following mechanical considerations for a fixed prosthesis: - Retention and resistance form; - Magnitude of dislodging force; - Geometry of tooth preparation; - Taper; - Surface area; - Stress concentration; - Type of preparation; - Roughness of fitting surface of restoration; - Material being cemented; - Factors affecting retention in FPD - Occlusion.
5	Oral manifestations of local and systemic diseases	Discuss the problems for fixed prosthesis related to: - Xerostomia; - Poor healing; - Osteoporosis; - Osteopenia; - Autoimmune diseases.

COURSE TOPIC: CROWN AND FIXED PARTIAL DENTURE (INDIRECT RESTORATIONS)

S.NO	TOPIC	LEARNING OBJECTIVES
1	Introduction of fixed partial denture	Define fixed partial denture. Discuss the Indications and contraindications for fixed partial dentures.
2	Components of Fixed partial denture	Define the following: - Connector; - Pontic; - Retainer; - Abutment.
3	Classification of Fixed Partial Denture	Classify fixed partial dentures.
4	Fixed Partial Denture types	Discuss the following types of fixed partial dentures: - Conventional bridges; - Minimum preparation bridges; - Fixed – fixed bridge; - Fixed – moveable bridge; - Cantilever bridge; - Spring cantilever bridge.
5	Crown and types of crowns	Discuss the various partial and full coverage indirect restorations. Describe the principles of tooth preparation for indirect restorations. Discuss the indications, contraindications, clinical assessment required and the steps of preparation for provision of Inlay and Onlay. Discuss the: - Materials available for these restorations; - Fluid management and soft tissue management; - Impression making and laboratory steps for inlays and onlays; - Materials used and clinical procedure for cementation; - Latest innovations including cad-cam technology.
6	Porcelain laminated veneers	Discuss the indications and contraindications for veneers. Describe diagnostic procedures involved in treatment planning. Discuss the importance of quality and quantity of enamel for predictable bonding. Demonstrate following: - Tooth preparation, soft tissue management and impression making for veneers; - Methods of temporization; - Steps of veneer placement; - Techniques for intra oral repair of indirect restorations.

S.NO	TOPIC	LEARNING OBJECTIVES
7	Full Veneer	Discuss the indications and contraindications for: - Porcelain fused to metal crown; - All metal crown; - All ceramic crown. Elaborate the factors that influencing shade selection. List various methods of shade selection. Demonstrate the clinical assessment required, steps of preparation, soft tissue management, impression making, laboratory steps and cementation procedure for: - Porcelain fused to metal crown; - All metal crown; - All ceramic crown. Discuss materials available for these restoration fabrication and cementation. Discuss the indications, contra indications and technique for the use of electro surgery. Discuss the latest innovations including CAD-CAM technology.
8	Implant Supported Restorations	Discuss indications and contraindications of implant supported restorations. Describe various implant supported restorations that can be used for replacement of missing teeth.
9	Fixed Partial Denture Design	Discuss the following: - Design consideration for individual conditions; - Material selection; - Biomechanical considerations; - Abutment selection; - Special cases; - Condition of residual ridge; - Occlusion with opposing teeth.
10	Abutment and retainer selection	Discuss the types of retainers based on: - Tooth coverage; - Material being used. Discuss criteria for selection of retainers and abutments: - Alignment of abutment teeth and retention; - Appearance and condition of abutment teeth; - Cost Preservation of tooth structure; - Location, condition and position of tooth; - Root configuration and support; - Crown root ratio; - Periodontal ligament area; - Assessment of pulpal health. Discuss various types of abutments: - Healthy/ideal abutments; - Cantilever abutments; - Pier abutments; - Tilted abutments; - Extensively damaged abutments; - Implant abutments.

S.NO	TOPIC	LEARNING OBJECTIVES
11	Margin placement and pontic design	Discus the types, general design consideration and characteristics of margin designs: - Shoulder; - Chamfer; - Slope shoulder; - Shoulder with bevel; - Feather edge; - Chisel edge; - Bevel. Discuss factors affecting pontic design: - Available space; - Contour of ridge; - Amount of occlusal load.
12	Material considerations and cementation	Discuss the types composition, properties, merits and demerits of materials used for cementation.
13	Tooth preparation	Discuss the following Principles of tooth preparation: - Biological consideration; - Mechanical consideration; - Esthetic consideration. Demonstrate the following: - Tooth preparation for a single unit crown; - Impression procedures; - Double mix technique; - Single mix technique; - Triple tray technique; - Copper tube impression; - Post space impression; - Temporary crown fabrication; - Lab procedures; - Waxing; - Spruing; - Investing; - Burnout; - Casting; - Soldering; - Ceramic veneering; - Cementation final; - Post cementation follow up; - Complication and management.

S.NO	TOPIC	LEARNING OBJECTIVES
14	Resin bonded bridge	Discuss the indications, contraindications, advantages and disadvantages of different types of resin bonded bridges: - Rochette bridge; - Maryland bridge; - Cast mesh fixed partial dentures; - Virginia Bridge.
15	Temporization	Discuss the biological, mechanical and esthetic considerations for temporization.

COURSE TOPIC: IMPLANTOLOGY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Types of implants	Discuss the following types of implants: - Endosteal; - Sub periosteal; - Transosteal. Describe the following components of implants: - Implant body; - First stage cover screw; - Second stage (healing cap); - Abutment; - for screw retention; - for cement retention; - for attachment - hygiene screw; - transfer coping; - abutment or implant body; - analog; - abutment or implant body; - coping; - prosthesis screw. Discuss the advantages, disadvantages, indications and contraindications of implants. Demonstrate the Impression techniques for implants.

S.NO	TOPIC	LEARNING OBJECTIVES
2	Osteo integration and biocompatibility.	Discuss the following: - Osteo integration; - Bio integration; - Mechanism of osteo integration; - Stages of osteo integration; - Theories of bone to implant interface. Classify factors influencing the osteo integration. Discuss the advantages, disadvantages, indications and contraindications of hydroxyapatite crystal and titanium plasma coating. Demonstrate methods to check osteo integration: - Percussion test; - Radiographs; - Probing depth.
3	Prosthodontic options	Discuss the following prosthodontics options for implants: - FP1; - FP2; - FP3; - RP4; - RP5; Discuss the advantages and disadvantages of screw retained and cement retained prosthesis.
4	Limitation of implants	Discuss the following limitations of implants: - Age; - Patient desire and fear; - Time and cost of treatment; - Consequence of failure; - Adjacent tooth mobility; - Bone height, length and width; - Soft tissue drape; - Challenging aesthetics; - Systemic diseases; - Crown height space.
5	Clinical and laboratory procedure	Discuss the clinical procedures for implant restorations: - One stage implant placement technique; - Two stage implant placement technique; - Impression technique; - Jaw relation; - Try in. Discuss laboratorial procedures for implant restorations.

COURSE TOPIC: MAXILLO FACIAL PROSTHESIS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Classification of congenital and acquired defects.	Discuss: - Congenital maxillary defects (Cleft lip and palate); - Acquired maxillary defects (Total and partial maxillectomy); - Mandibular defects; - Velo-pharyngeal defects.
2	Principles governing management of patients presenting with various defects	Describe the treatment of mandibular defects. Discuss mandibular guidance prosthesis. Discuss treatment of soft and hard palate defects.
3	Obturators	Discuss the advantages and retention of surgical obturator prosthesis.
4	Cleft palate prosthesis	Define Pre surgical nasoalveolar molding appliance.
5	Speech aid prosthesis	Classify the speech aid prosthesis based on: - physiological and anatomical insufficiency; - Types of speech aid. List advantages of speech aid prosthesis.
6	Facial prosthesis	Discuss the following defects: - Auricular defects; - Nasal defects; - Ocular defects; - Lip and cheek defects.
7	TMD splints	Discuss the following types of splints and its indications: - Stabilization appliance; - Anterior positioning appliance; - Soft or resilient appliance.
8	Bite raising appliance	Discuss the Dahl appliance and anterior bite plane.
9	Splints and stents	Describe the Shielding and positioning stents.

COURSE TOPIC: OCCLUSION INCLUDING TMD/MPD

S.NO	TOPIC	LEARNING OBJECTIVES
1	Theories and principles of occlusion	Describe optimum functional occlusion. Discuss the following occlusal schemes: - Canine guided; - Group function; - Mutually protected. Discuss determinants of occlusal morphology: - Posterior controlling factors (condylar guidance); - Anterior controlling factors (anterior guidance); - Vertical determinants of occlusal morphology; - Horizontal determinant of occlusal morphology.
2	Concept, etiology, treatment planning and options	Discuss the etiology of TMDs. Formulate a management plan for patients presenting with TMDs including: - Supportive therapy; - Definitive therapy.

COURSE TOPIC GERODONTOLOGY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Effects of medication on oral health	Discuss the following conditions of oral cavity: - Xerostomia; - Sialorrhoea (increased salivation); - Lichen planus; - Aphthous like ulcers; - Pigmentation; - Gingival enlargement; - Burning mouth syndrome; - Loss of taste; - Pseudomembranous candidiasis; - Angular cheilitis; - Osteonecrosis of jaw.
2	dental conditions having oral manifestation	Discuss the following dental conditions having oral manifestations: - Pulmonary conditions; - Skin diseases; - Connective tissue disorders; - Liver disease; - Hematological disorders; - Autoimmune disease.

S.NO	TOPIC	LEARNING OBJECTIVES
4	Xerostomia	Define xerostomia. Discuss the causes, clinical features, effects on prosthesis of xerostomia and its diagnosis and management.
5	Root caries	Discuss clinical features, microbiology, diagnosis and factors which predispose to root caries.
6	Geriatric nutrition	Discuss the nutritional balance based on: - Complex carbohydrates; - Protein enriched diet; - Calcium rich food; - Excessive water. Discuss the disadvantages to limit the intake of: - Simple sugar; - Fat; - Sodium.

ORTHODONTICS

COURSE TOPIC: -INTRODUCTION TO ORTHODONTICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Introduction, Overview and branches of Orthodontics	Define the terminologies related to orthodontics. Discuss the following: - Types of Orthodontic treatments; - Objectives; - Preventive treatment; - Interceptive treatment; - Corrective treatment.
2	Indications/contraindications; Aims and need of Orthodontic Treatment	

COURSE TOPIC: -GROWTH AND DEVELOPMENT

S.NO	TOPIC	LEARNING OBJECTIVES
1	Basic Concepts of Growth and Development Prenatal and Postnatal craniofacial growth Theories of Growth Clinical application of growth and development	Define basic concepts of growth and development. Discuss the following: - Variables affecting growth; - Prenatal and postnatal craniofacial growth; - Methods of studying growth; - Theories of growth. Discuss TMJ Development.

COURSE TOPIC GERODONTOLOGY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Basic Concepts of Occlusion Development of dentition	Classify malocclusion. Discuss the following: - Clinical Features of Normal Occlusion; - Difference between Occlusion and class I malocclusion; - Andrews Six Keys of Occlusion.

COURSE TOPIC: -DIAGNOSTIC AIDS IN ORTHODONTICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Diagnosis and clinical evaluation Record Keeping Cast analysis	Take a comprehensive History of patients coming to OPD Perform: - Clinical Evaluation; - Extraoral examination; - Intraoral examination; - Cephalometric Tracing and analyses;

S.NO	TOPIC	LEARNING OBJECTIVES
	Mixed dentition analysis and Bolton analysis Cephalometrics- I Cephalometrics- II	- Tooth mass and size analyses; - Cast analysis; - Bolton Analysis; - Mixed Dentition analysis. Formulate a problem list. Interpret Cephalometric radiograph. Identify relevant anatomical structures and landmarks on: - OPG (Orthopantomogram); - Occlusal View; - SLOB rule (periapical view). Justify use of various radiographs in different scenarios.

COURSE TOPIC: DEVELOPMENT OF DENTITION AND OCCLUSION

S.NO	TOPIC	LEARNING OBJECTIVES
1	Theories of Tooth Eruption Classification of occlusion Development of Occlusion	Discuss the following: - Prenatal development of dentition; - Features of primary, mixed and permanent dentition period; - Dimensional changes in dental arch; - Variations in development including size, form, number and position of teeth; - Factors affecting development.

COURSE TOPIC: MALOCCLUSION AND ETIOLOGY OF MALOCCLUSION

S.NO	TOPIC	LEARNING OBJECTIVES
1	Classification of Malocclusion Etiology of malocclusion	Define malocclusion. Classify malocclusion. Discuss Local and hereditary environmental factors that can cause malocclusion: - Parafunctional habits; - Thumb sucking; - Bruxism; - Tounge thrusting; - Lip sucking; - Mouth breathing; - Syndromes related to orthodontics;

S.NO	TOPIC	LEARNING OBJECTIVES
		- Treacher-Collins; - Pirre-Robin Syndrome; - Ectodermal Dysplasia; - Down's Syndrome; - Cleido Cranial Dysplasia; - HemifacialMicrosomia; - Acchondroplasia.

COURSE TOPIC: -PREVENTIVE AND INTERCEPTIVE ORTHODONTICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Preventive Orthodontics Interceptive Orthodontics Space supervision and Gross discrepancy	Discuss the following: - Diagnosis and management of habits; - Space supervision; - Space maintainers; - Space regainers; - Serial extractions.

COURSE TOPIC: BONE METABOLISM

S.NO	TOPIC	LEARNING OBJECTIVES
1	Bone Biology Orthodontic Tooth Movement Mechanism Factors affecting OTM	Discuss the following: - Normal structure of periodontal ligament and bone; - The role of bone in eruption and stabilization; - Effects of orthodontic force; - Factors affecting tooth movement.

COURSE TOPIC: -BIOMECHANICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Basic concepts of Biomechanics Orthodontic Materials	Discuss: - Structure and function of PDL; - Types of wires and alloys used in orthodontics; - Ideal properties of orthodontic wires and comparison of different alloys; - Deleterious effects of Orthodontics forces; - Skeletal effects of Orthodontic Forces.

COURSE TOPIC: ANCHORAGE, RETENTION, RELAPSE AND STABILITY

S.NO	TOPIC	LEARNING OBJECTIVES
1	Anchorage Principles of Orthodontic Retention Types of Retainers	Discuss the concept and types of: - Control of anchorage; - Retention and relapse; - Occlusal stability and factors related to retention; - Strategies of management.

COURSE TOPIC: -REMOVABLE APPLIANCE

S.NO	TOPIC	LEARNING OBJECTIVES
1	Classification Biomechanics of Removable appliances	Discuss types, indications, and construction of functional appliances and other extra oral appliances for tooth movement.

COURSE TOPIC: -GROWTH MODIFICATION

S.NO	TOPIC	LEARNING OBJECTIVES
1	Biomechanics of Functional Appliances Expanders	Discuss Concept, indications, drawbacks, components and accessories of removable functional appliances. Classify removable functional appliances.

COURSE TOPIC: -FIXED APPLIANCES

S.NO	TOPIC	LEARNING OBJECTIVES
1	Fixed appliances I Fixed appliances II Bonding and Banding	Discuss the background of different fixed appliances systems. Discuss the indications, draw backs, components and accessories of fixed appliances. Describe the following: - Wire systems; - Bonding and banding material; - Edgewise and straight.

COURSE TOPIC: TREATMENT PLANNING

S.NO	TOPIC	LEARNING OBJECTIVES
1	Management of non-skeletal problems Management of Class I malocclusion Management of Class II Div 1 malocclusion Management of Class II Div 2 malocclusion Management of Class III malocclusion Impacted Canine Management	Discuss the following: - Non-skeletal problems including Class I malocclusion; - Crowding; - Spacing; - Cross bite; - Open bite; - Deep bite; - Skeletal problems Class II Division 1 and Division 2; - Class III; - Extractions in Orthodontics; - Adjunctive treatment goals and principles.

COURSE TOPIC: SURGICAL ORTHODONTICS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Introduction and Orthognathic Surgical Principles, Indications/ Contraindications of Surgical management	Discuss the following: • Principles of orthognathic surgery; • Class II Surgical treatment options; • Class III surgical treatment options; • Indication and contraindications.

COURSE TOPIC: -CLEFT LIP AND PALATE

S.NO	TOPIC	LEARNING OBJECTIVES
1	Introduction, Etiology and Clinical Features Nasoalveolar Molding Techniques Clinical and Orthodontic Management	Discuss the etiology, clinical features, general and orthodontic management of Cleft Lip and Palate patients.

COURSE TOPIC: -ADULT ORTHODONTICS AND PERIODONTAL CONSIDERATIONS

S.NO	TOPIC	LEARNING OBJECTIVES
1	Anatomy of Periodontal Structures Etiology and Clinical Features of Periodontal Diseases Minor adjunctive Procedures in Orthodontics Clear aligner therapy Orthodontic management of Periodontal diseases	Discuss anatomy, etiology, clinical features of periodontal diseases. Classify periodontal diseases. Discuss role of orthodontist in management of periodontal Diseases.

S.NO	TOPIC	LEARNING OBJECTIVES
2	Wire bending exercise Comprehensive orthodontic case presentation of a non-skeletal malocclusion.	Demonstrate the following: - Adams clasp; - Labial Bow; - Canine retractor; - Cantilever and Z spring; - Arch wire fabrication; - Removable appliances (Hawley's Retainer). Take a complete history of patient presenting to OPD. Perform: - Clinical Examination; - Cast analysis; - Mixed dentition analysis; - Ceph Analysis; - OPG Analysis. Diagnose malocclusion. Write down a problem list. Formulate a treatment plan. Justify the type of fixed appliance type and retention plan to be given.

G-10/4, Mauve Area, Islamabad

Tel: (051) 910 6172