Frontier Medical & Dental College

CURRICULUM

BACHELOR OF DENTAL SURGERY

BDS 2026

Frontier Dental College, Abbottabad



DEPARTMENT OF DENTAL EDUCATION

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LIST OF ABBREVIATIONS

Abbreviation	Full Form / Definition
AI	Artificial Intelligence
ART	Atraumatic Restorative Treatment
BCQ	Best Choice Question (Single Best Answer)
BLS	Basic Life Support
BU	Bahria University
CAD/CAM	Computer-Aided Design / Computer-Aided Manufacturing
CBL	Case-Based Learning
CPITN	Community Periodontal Index of Treatment Needs
CPC	Clinicopathological Conference
CVS	Cardiovascular System
DME	Department of Medical Education
DMFT	Decayed, Missing, Filled Teeth Index
DOPS	Direct Observation of Procedural Skills
EBM	Evidence-Based Medicine / Evidence-Based Dentistry
ECE	Early Clinical Exposure
EMR	Electronic Medical Record
ENT	Ear, Nose and Throat (Otorhinolaryngology)
EOM	End-of-Module Examination
FDC	Frontier Dental College, Abbottabad
FMDC	Frontier Medical & Dental College, Abbottabad
HEC	Higher Education Commission (Pakistan)
KSA	Knowledge, Skills, and Attitudes
Mini-CEX	Mini Clinical Evaluation Exercise
MSK	Musculoskeletal System
OMFS	Oral and Maxillofacial Surgery
OPD	Outpatient Department
OSCE	Objective Structured Clinical Examination
OSPE	Objective Structured Practical Examination
OT	Operating Theatre
PBL	Problem-Based Learning
PMDC	Pakistan Medical and Dental Council
PSIL	Problem-Solving Interactive Learning
SDL	Self-Directed Learning
SEQ	Short Essay Question
SGD	Small Group Discussion
SJTH	Shahina Jamil Teaching Hospital, Abbottabad
TBL	Team-Based Learning
TMJ	Temporomandibular Joint
TOS	Table of Specifications
WBA	Workplace-Based Assessment
WFME	World Federation for Medical Education

PREFACE

This Curriculum Document serves as the official academic blueprint and educational roadmap for the Bachelor of Dental Surgery (BDS) program at Frontier Dental College (FDC) / Frontier Medical & Dental College (FMDC), Abbottabad. It provides a comprehensive, rigorous overview of the program's philosophy, modular architecture, subject content, instructional strategies, and assessment framework, ensuring flawless alignment with national and international benchmarks in dental education.

In response to dynamic advancements in oral health science and pedagogy, the BDS curriculum follows an innovative hybrid modular system as prescribed by the Pakistan Medical and Dental Council (PMDC) and Bahria University. It seamlessly integrates basic biomedical disciplines, dental paraclinical sciences, and clinical specialties with early clinical immersion, phantom head simulation, and community-based dental education. This scaffolded model bridges foundational sciences with chairside operative competency, empowering students to progress systematically from basic cellular and anatomical knowledge to complex oral diagnostic, surgical, and restorative interventions.

A distinctive feature of our dental curriculum is the longitudinal integration of the PLACE Framework (Professionalism, Leadership, Applied Research, Communication Skills, and Ethics), alongside modern digital health components including Artificial Intelligence in Dentistry, Dental Materials Informatics, and Digital CAD/CAM workflows. These longitudinal pillars run uninterrupted across all four years, cultivating empathetic, ethically anchored, critically discerning oral health leaders.

The curriculum is strictly benchmarked against the standards of the Pakistan Medical and Dental Council (PMDC), the World Federation for Medical Education (WFME), the Higher Education Commission (HEC), and the examination regulations of Bahria University, Islamabad. Sincere gratitude is extended to the Department of Medical Education (DME), the Board of Studies in Dentistry, the Academic Council, the Curricular Committee, and the faculty members of Frontier Dental College for their dedication. It is our institutional conviction that this curriculum will produce dental surgeons of exceptional clinical competence, ethical integrity, and community dedication who will lead the advancement of oral healthcare in Pakistan and globally.

Department of Dental Education (DDE)
Frontier Medical & Dental College, Abbottabad

MESSAGE FROM THE CEO FMDC ABBOTTABAD

Frontier Medical & Dental College (FMDC) stands as a pioneering institution in Pakistan's medical and dental education landscape. Established in 1995 under the visionary leadership of Prof. Dr. A. J. Khan, FMDC holds the proud distinction of being the first private medical institute in Khyber Pakhtunkhwa and the second private medical school in the country. Over the past three decades, our institution has expanded into a center of excellence comprising both Medical and Dental colleges, dedicated to academic distinction, compassionate healing, and societal service.

Situated on an expansive, picturesque campus at the foothills of pine-clad hills along the Karakoram Highway in Abbottabad, FMDC provides an inspiring environment for higher learning. Frontier Dental College (FDC) operates within this academic ecosystem, affiliated with Bahria University and fully recognized by the Pakistan Medical and Dental Council (PMDC) and the Higher Education Commission (HEC). Our clinical and dental training is anchored by state-of-the-art facilities: the purpose-built Dental Hospital OPDs on campus, the multidisciplinary collaboration with Shahina Jamil Teaching Hospital (SJTH), Abbottabad

At Frontier Dental College, our goal is to graduate dental professionals who are not merely proficient clinicians, but compassionate oral healthcare leaders equipped with sound ethics, inquiry-driven intellects, and community responsibility. The BDS curriculum is intentionally structured to foster clinical reasoning, hand-eye dexterity, digital dental literacy, and empathetic communication. As you embark on this demanding yet rewarding journey, remember that dentistry is a noble blend of science, artistry, and ethical stewardship. Your hands will relieve pain, restore dignity, and enhance the quality of human life. I warmly welcome you and wish you every success in your academic and professional endeavors at Frontier Dental College.

Dr. Asad Jamil Khan
Chief Executive Officer
Frontier Medical & Dental College, Abbottabad

MESSAGE FROM THE PRINCIPAL DENTAL SECTION

It is a privilege to introduce the BDS Curriculum Document for Frontier Dental College, Abbottabad. Since our foundation in 2009, our institution has remained steadfast in its commitment to providing high-quality medical and dental education that responds directly to the healthcare challenges facing our province and the nation.

Dentistry has evolved dramatically over recent years. Modern dental practice demands a seamless transition from foundational biological principles to high-precision operative, surgical, and restorative patient care. To achieve this, our four-year BDS curriculum adopts a hybrid modular structure that horizontally coordinates disciplines such as Anatomy, Physiology, Biochemistry, and Oral Biology in the initial phase, progresses through Pathology, Pharmacology, and Dental Materials in the pre-clinical phase, and culminates in rigorous hospital ward postings and extensive clinical chairside clerkships across all dental specialties in the third and final years.

Our purpose-built dental teaching hospital features comprehensive specialized outpatient departments, modern phantom head simulation laboratories, state-of-the-art digital dental imaging facilities, and fully equipped oral and maxillofacial surgical theatres. Supported by an accomplished faculty and structured mentorship programs, our students are challenged to master technical excellence, reflective practice, and professional accountability.

We urge our dental students to embrace this curriculum with passion, curiosity, and uncompromising integrity. You are entering a profession where precision, artistry, and empathy must continually meet ethical responsibility. We look forward to guiding you into becoming the healthcare leaders of tomorrow.

Principal, Frontier Dental College

MISSION & VISION



1.0 Introduction

The Bachelor of Dental Surgery (BDS) curriculum at Frontier Dental College (FDC), Abbottabad, is designed in strict compliance with the academic regulations of Bahria University, Islamabad, and the statutory standards prescribed by the Pakistan Medical and Dental Council (PMDC). The curriculum is engineered to educate and train competent, ethical, socially accountable, and reflective dental surgeons equipped with the clinical dexterity, scientific knowledge, diagnostic acumen, and professional attitudes required for contemporary oral healthcare practice and lifelong learning.

1.2 Purpose

The BDS curriculum aims to provide students with a robust foundation in general biomedical sciences, oral biology, biomaterials, and dental paraclinical disciplines while progressively mastering technical clinical competencies across all recognized dental specialties. It emphasizes evidence-based clinical reasoning, procedural dexterity, patient safety, preventive community dentistry, and ethical professionalism, preparing graduates to deliver safe, high-quality, patient-centered oral healthcare.

1.3 Scope

The BDS program is structured as a four-year (4-year) undergraduate degree program comprising twelve (12) modules, followed by a mandatory one-year rotating clinical house job (internship).

1. Pre-Clinical & Foundation Phase (Years 1 & 2 / Modules I – VI): System-based and discipline-integrated learning covering basic biomedical sciences, oral biology, tooth morphology, dental materials, pathology, pharmacology, community dentistry, and pre-clinical phantom head operative and prosthodontic skills.
2. Clinical & Hospital Phase (Year 3 / Modules VII – IX): Integration of clinical dental disciplines (Oral Pathology, Oral Medicine & Radiology, Periodontology) with General Hospital Medicine and General Surgery ward postings, emergency triage, and initial direct patient encounters.
3. Advanced Clinical Clerkship Phase (Final Year / Modules X – XII): Immersive clinical rotations across core dental specialties including Operative Dentistry & Endodontics, Prosthodontics, Oral & Maxillofacial Surgery, Orthodontics, and Paediatric Dentistry.

1. 4 Teaching Methodologies

Educational delivery utilizes a rich repertoire of student-centered learning strategies to optimize student engagement, retention, and critical clinical synthesis:

1. **Interactive Large Group Lectures** (IL) utilizing digital multimedia, clinical triggers, and active response mechanisms.
2. **Small Group Discussions (SGD),** Tutorials, and Team-Based Learning (TBL).
3. **Problem-Based Learning (PBL)** utilizing the Maastricht 7-jump methodology to analyze authentic oral and systemic health scenarios.
4. **Case-Based Learning (CBL) and Problem-Solving Interactive Learning (PSIL)** emphasizing clinical diagnostic pathways and treatment planning.

5. Pre-Clinical Phantom Head and Skills Laboratory training to build motor control, ergonomics, cavity preparations, and prosthodontic waxing/setup.
6. Direct Chairside Outpatient Teaching, Supervised Patient Encounters, and Operating Theatre (OT) exposure.
7. Community-Oriented Dental Outreach Programs, school screenings, and field research projects.

1. 5 Assessment Framework

Assessment is constructively aligned with approved curricular learning outcomes and governed by the Bahria University Table of Specifications (TOS) and PMDC statutory regulations. The evaluation system incorporates:

1. **Continuous Internal Assessment (20%):** Formative and summative assessments administered by FMDC, including End-of-Module (EOM) examinations (written MCQs/SEQs and practical OSPE/OSCE), class tests, clinical logbooks, Mini-CEX PBL/CBL/TBL, and professionalism evaluations.
2. **Annual Professional Examination (80%):** Summative examinations conducted by Bahria University at the end of each academic year, comprising external written papers and comprehensive practical/clinical examinations (OSPE, OSCE, and Viva Voce).

1.6 Continuous Improvement

The curriculum undergoes continual evaluation through the Department of Dental Education (DME) and the Curriculum Committee. Systematic feedback is collected from students, faculty, external examiners, alumni, and community health partners. These data drive annual pedagogical refinements, curricular realignment, and faculty development to ensure that Frontier Dental College maintains national leadership in dental education.

2.0 BDS CURRICULUM

2.1 Graduate Profile

The Bachelor of Dental Surgery (BDS) program at Frontier Dental College is designed to graduate well-rounded oral healthcare professionals who embody clinical competence, ethical integrity, scientific curiosity, and societal accountability. A Frontier Dental College graduate is expected to function as:

I. A Safe and Competent Dental Clinician capable of providing comprehensive, evidence-based preventive, restorative, and surgical oral care.
II. An Astute Diagnostician and Critical Thinker who integrates biomedical, dental, and systemic health knowledge to formulate prioritized treatment plans.
III. An Empathetic Communicator who builds trust with patients, explains complex procedures clearly, and counsels patients and families effectively.
IV. An Ethical Role Model who adheres strictly to professional codes of conduct, respects patient autonomy, and maintains confidentiality.
V. A Community Oral Health Advocate dedicated to reducing oral disease disparities, promoting prevention, and leading public health initiatives.
VI. A Dental Researcher and Scholar who critically appraises scientific literature, applies modern innovations, and contributes to evidence-based dentistry.
VII. A Collaborative Team Leader and Lifelong Learner committed to continuous professional development and personal growth.

2.2 Program Objectives

The BDS program seeks to achieve clearly articulated objectives categorized across the three educational domains: Knowledge, Skills, and Professional Attitudes & Values:

2.1 Knowledge

a. Demonstrate an in-depth understanding of the biomedical, behavioral, and clinical sciences underpinning normal oral-facial development, structure, and homeostasis.
b. Elucidate the etiopathogenesis, histopathology, clinical manifestations, and pharmacological management of oral, dental, c. and craniofacial disorders.
d. Recognize the bilateral relationships between systemic diseases and oral health, and safely manage medically compromised dental patients.
e. Describe the physical, chemical, and biological properties of restorative, prosthetic, and surgical biomaterials and their rational clinical selection.
f. Explain the principles of oral epidemiology, biostatistics, preventive dentistry, cross-infection control, and health systems management.

2.2 Skills

a. Perform thorough extra-oral and intra-oral clinical examinations, accurately interpret dental and maxillofacial radiographs, and synthesize diagnostic data into logical treatment plans.

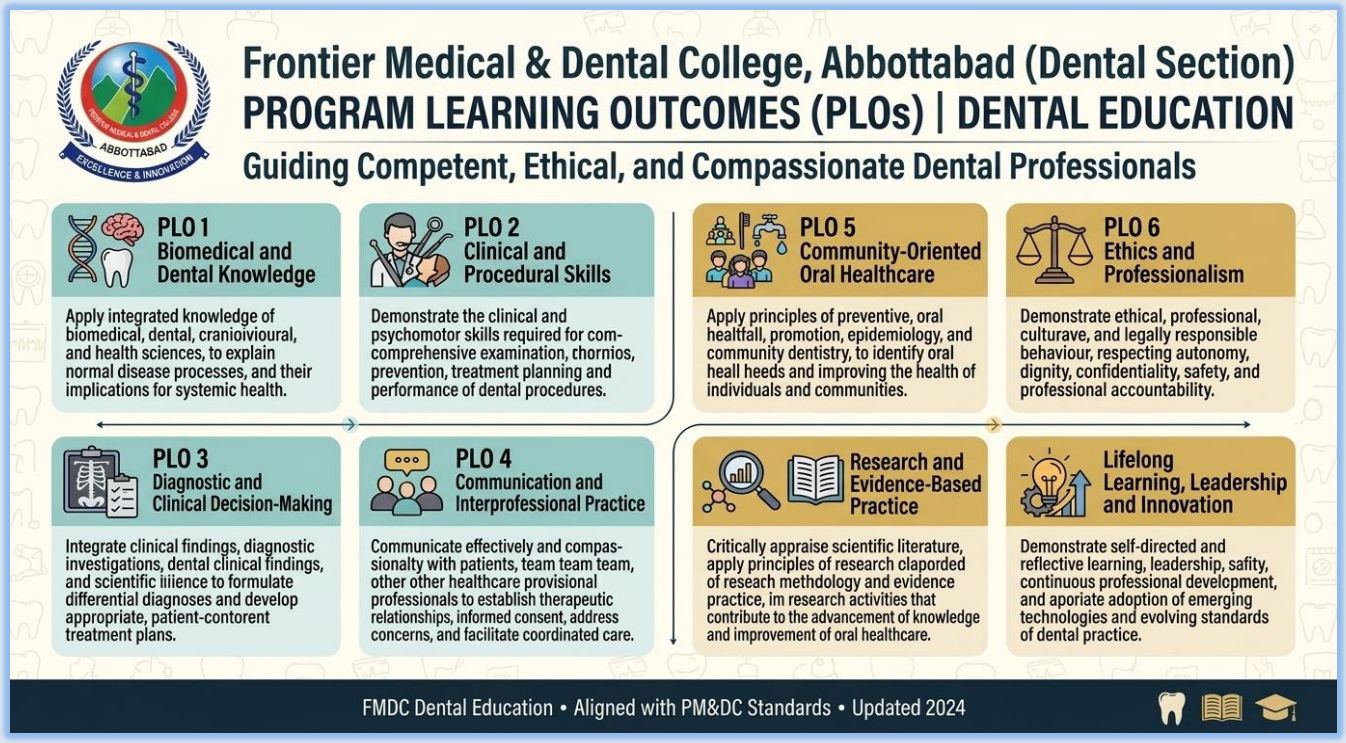
b. Execute essential preventive, restorative, endodontic, periodontal, prosthetic, orthodontic, paediatric, and minor oral surgical procedures safely and efficiently.
c. Manage common acute medical and dental emergencies in the dental operatory, including anaphylaxis, syncope, hemorrhage, and cardiopulmonary arrest (BLS).
d. Employ rigorous infection control, sterilization, radiation safety, and waste management protocols to safeguard patients, staff, and the environment.
e. Apply digital technologies, electronic health records, and research methodologies in contemporary dental practice.

2.3 Professional Attitudes and Values

a. Uphold the highest standards of professional ethics, integrity, legal compliance, and altruism in all professional encounters.
b. Demonstrate empathy, compassion, cultural sensitivity, and respect for patient rights, informed consent, and confidentiality.
c. Engage in reflective practice, recognize personal limitations, seek appropriate peer consultations, and commit to continuous lifelong professional learning.
d. Champion oral disease prevention, public health awareness, and equitable access to dental care within underserved rural and urban communities.

3.0 PROGRAM LEARNING OUTCOMES (PLOs)

Upon successful completion of the four-year BDS program at Frontier Dental College, graduates will achieve the following eight core Program Learning Outcomes (PLOs):



.Curricular Outcomes

FRONTIER MEDICAL & DENTAL COLLEGE, ABBOTTABAD

Department of Medical & Dental Education | Bachelor of Dental Surgery (BDS) Curricular Outcomes (COs) Framework

Code	Curricular Outcome Title	Curricular Benchmark	Detailed Competency & Outcome Description
CO1	Clinically & Procedurally Adept	Demonstrate psychomotor precision, charside safety, and clinical competence in dental procedures.	Demonstrates advanced psychomotor dexterity and safe clinical execution across preventive, operative, endodontic, periodontic, and basic surgical dental treatments. Adhiress rigorously to infection control protocols, ergonomic chairside positioning, four-handed dentistry, and comprehesive patient safety guidelines during all clinical interventions.
CO2	Scientifically Grounded	Apply biomedical, craniofacial, and biomaterial sciences to clinical resoning	Synthesizes core principles of human biology, head and neck anatomy, craniofacial growth, general pathology, dental histology, and material scienees. Applies founlational scientific knowledge to understand pathogeness, predict material fissue interactions, and establish biologically sound chinical rationale for oral health interventions.
CO3	Oral Health & Prevention Advocate	Promote oral health, preventive strategies, and community dental screenings.	Champions disease prevention and oral hygiene promotion at both the individual patient and community population levels. Designs, implements, and evaluates community based oral screenings, educational campaigns, and preventative regimers–including topical flooride application, fissure sealarts, detery counseling, and risk factor cessation.
CO4	Analytical & Diagnostic Reasoner	Analyze clinical data and radiographs offtically to devise evidence based treatment plans.	Systematically gathers and interprets dlagnostic records, patient medical and dental histories, intraora/extraoral findings, pulp vitality assessments, and radiographic imagery (introoral periopical, panoramic, and cone-beam CT). Excerises critical diagnestic ressoning to formulate comprehensive, sequenced, and evidence-based patient-centered treatment plans.
CO5	Ethical Professional	Exhibit bioetthical values, empathy, jurisprudence, and patient autononry.	Conducts clinical practice within the legal fnmework, dental jurisprudence, and Pakistan Medical and Dental Council / regulatory guidelines. Upholds core bioethical prinicples–autonomy, beneficence, non-malefeence, and justice–ensuring robust informed consent, patient confidentialty, empathetic dector patient relationships and cultural sensitivity.
CO6	Inquisitive Scholar	Engage in scholarly dental inquiry, literature appraisal, and research activities.	Exhibits intellectual cultusily and scholorly discipline by formulating structured clinical inquiry questions, conducting literature searches, and criticaly appraising dental research and clinical tirles. Actively participates in basis of clinical dental research projects and translates validated scientific findings into everyday patient care.
CO7	Collaborative Leader & Role Model	Demonstrate leadership, effective to communication, and serve as a professional role model.	Collaborates seamleshy with multidisciplimary healthcare teams, dental auxilaries, laboratory technicians, medical specialts. Demonstrates clear interpersonal communication, conffict resolution, professionship, mentorship of junior peers, and unwaering adherence to professional decooum and alturism.

Source: Derived from Appendix A: Program Outcome – Curricular Outcome Mapping (BDS Program), Frontier Medical & Dental College, Abbottabad.

4.0 Alignment between Program Learning Outcomes (PLOs) and Curricular Outcomes (COs)

Curricular Outcomes (COs) represent the foundational competencies developed across modules and disciplines that directly support the achievement of Program Learning Outcomes (PLOs):

Alignment between Program Learning Outcomes (PLOs) and Curricular Outcomes (COs)

FRONTIER MEDICAL COLLEGE, ABBOTTABAD
EXCELLENCE & INNOVATION

Curricular Outcome	Competency Description	Primary PLOs Supported	Bahria University Role Supported
CO1 - Skillful	Demonstrates dexterity and competence in diagnostic, procedural, operative, and digital dental skills to deliver safe, effective patient care.	PLO 2, PLO 3, PLO 4	Care Provider, Manager
CO2 - Knowledgeable	Applies principles of biomedical, dental paraclinical, and clinical dental sciences to explain health, disease, and biomaterial interactions.	PLO 1, PLO 3	Care Provider, Decision Maker
CO3 - Community Health Promoter	Promotes oral and systemic health through preventive strategies, epidemiology, oral health education, and advocacy for underserved populations.	PLO 5, PLO 6	Community Leader
CO4 - Critical Thinker	Analyzes complex clinical and diagnostic problems, synthesizing evidence and clinical guidelines for sound clinical decision-making.	PLO 3, PLO 7	Decision Maker, Researcher
CO5 - Professional & Role Model	Demonstrates unwavering integrity, ethical practice, altruism, empathy, and adherence to legal and regulatory dental frameworks.	PLO 4, PLO 6	Professional, Communicator
CO6 - Scholar & Researcher	Engages in scientific inquiry, research methodologies, literature evaluation, and continuous self-directed learning to advance dental practice.	PLO 7, PLO 8	Researcher, Professional
CO7 - Leader & Collaborator	Exhibits leadership, effective clinic administration, teamwork, and interprofessional collaboration to improve oral health outcomes.	PLO 5, PLO 6, PLO 8	Community Leader, Manager

4.1 Alignment with PMDC Seven-Star Dental Practitioner Competencies

The BDS curriculum at Frontier Dental College is aligned with the internationally recognized PMDC Seven-Star Doctor/Dentist model. The table below delineates the alignment:

PMDC Role	Role Description	PLOs	COs	Key Learning Experiences
Care Provider	Delivers patient-centered oral health care that is technically precise, safe, ethical, and compassionate across all dental disciplines.	**PLO 1, PLO 2, PLO 3**	**CO1, CO2, CO5**	Skills Lab, Phantom Head training, Chairside patient care, Hospital rotations
Decision Maker	Applies scientific knowledge, clinical reasoning, and	**PLO 1, PLO 3,**	**CO2, CO4, CO6**	PBL, CBL, Clinical case conferences,

	evidence-based appraisal to establish accurate diagnoses and prioritized plans.	**PLO 7**		Radiographic analysis sessions
Communicator	Communicates effectively with patients, families, dental assistants, laboratory technicians, and interprofessional colleagues.	**PLO 2, PLO 4, PLO 6**	**CO1, CO3, CO5**	Chairside counseling, History taking, Informed consent role plays, Presentations
Community Leader	Works proactively with communities to reduce dental disease burden, advocate preventive fluoride programs, and promote oral health.	**PLO 5, PLO 6, PLO 8**	**CO3, CO7**	School dental screenings, Community oral health field visits, Outreach camps
Manager	Manages dental practice resources, operatory ergonomics, dental teams, clinical records, and infection control protocols efficiently.	**PLO 2, PLO 6, PLO 8**	**CO1, CO5, CO7**	Operatory management, Clinical governance sessions, Inventory & safety audits
Researcher	Engages in scientific inquiry, appraises clinical trials, applies dental biomaterials science, and conducts public health research.	**PLO 3, PLO 7, PLO 8**	**CO4, CO6**	Research methodology, Biostatistics project, Synopsis defense, Journal clubs
Professional	Upholds high ethical standards, altruism, accountability, confidentiality, patient autonomy, and professional identity.	**PLO 4, PLO 6, PLO 8**	**CO5, CO6, CO7**	PLACE modules, Bioethics tutorials, Clinical logbooks, Mentorship reflection

5.0 CURRICULUM FRAMEWORK

The BDS curriculum at Frontier Dental College is structured as an **integrated hybrid** curriculum model. It comprises twelve (12) thematic modules distributed across four (4) academic years (3 modules per academic year). The framework balances systemic biological principles, specialized dental sciences, hands-on simulation, hospital rotations, and comprehensive chairside clinical clerkships.

5.1 Traditional-Based Curriculum

During the first two years, the BDS curriculum follows a traditional discipline-based approach, with each subject taught separately according to its respective syllabus and learning objectives. In First Year BDS, students study Anatomy, Physiology, Medical Biochemistry, and Oral Biology. In Second Year BDS, the focus shifts to General Pathology, Microbiology, Pharmacology, Dental Materials, and Community Dentistry. Each discipline is delivered through its own lectures, practical sessions, and assessments, providing students with a structured foundation in basic medical and dental sciences. This traditional approach emphasizes subject-specific knowledge, systematic progression of content, and a clear understanding of the principles and concepts within each discipline.

5.2 Subject-Based Clinical Dental Curriculum

In the third and fourth years, students transition into subject-based clinical training. Third-year students rotate through core dental specialties (Oral Pathology, Oral Medicine, Periodontology) alongside mandatory hospital postings in General Internal Medicine and General Surgery at Shahina Jamil Teaching Hospital, Abbottabad. The final year is entirely dedicated to advanced clinical clerkships in Operative Dentistry & Endodontics, Prosthodontics, Oral & Maxillofacial Surgery, Orthodontics, and Paediatric Dentistry.

5.4 Student-Centered Learning

Active learning strategies—including Problem-Based Learning (PBL), Case-Based Learning (CBL), Directed Self-Learning (DSL), and Self-Directed Learning (SDL)—empower students to take ownership of their education. PBL sessions follow the structured Maastricht 7-jump model, challenging students to formulate diagnostic hypotheses and evaluate pathophysiological mechanisms collaboratively.

5.5 Non-Dental & HEC Based Subjects

The longitudinal PLACE Framework (Professionalism, Leadership, Applied Research, Communication Skills, and Ethics) runs across all four years. It instills moral principles, legal compliance, communication finesse, empathy, research acumen, and leadership, ensuring that students develop mature professional identities alongside clinical skills.

5.6 Longitudinal Themes Across All Four Years

To prepare graduates for twenty-first-century healthcare, eight longitudinal themes are systematically integrated across the four-year program:

a. **Professionalism:** Integrity, punctuality, ethical clinical dress code, professional boundaries, and accountability to patients.
b. **Leadership & Healthcare Management:** Team leadership, clinic administration, ergonomics, resource stewardship, and quality improvement.
c. **Applied Research & EBM:** Biostatistics, epidemiological survey design, critical literature appraisal, synopsis defense, and research ethics.
d. **Communication Skills:** Doctor-patient rapport, breaking bad news, obtaining informed consent, dealing with anxious/dental-phobic patients.
e. **Ethics & Medico-Legal Practice:** PMDC code of conduct, patient rights, autonomy, dental confidentiality, and malpractice prevention.
f. **Community Engagement & Outreach:** Field screenings, community oral health education, oral cancer screening, and rural health visits.
g. **Artificial Intelligence & Digital Dentistry:** AI-assisted radiographic interpretation, CAD/CAM milling, digital impressions, and teledentistry.
h. **Lifelong Learning & SDL:** Continuous medical/dental education (CME/CDE), reflective logbooks, and self-assessment of clinical outcomes.

6.0 YEAR-WISE BREAKDOWN OF CURRICULUM

The BDS curriculum is organized into four distinct academic years and four progressive phases comprising 12 modules. The structure is based on spiral integration and scaffolded learning, ensuring that students build competencies progressively from foundational scientific principles to independent clinical patient care.

Curricular Phase	Academic Year	Module Breakdown & Integrated Disciplines
Phase I: Foundations of Dental & Biomedical Sciences	**First Professional BDS**	1. Module I (12 Weeks): General Anatomy, Cell Biology, General Physiology, Blood, Foundation Biochemistry, Oral Cavity Boundaries & Tooth Morphology I 2. Module II (12 Weeks): Head & Neck Gross Anatomy, CVS & Respiratory Physiology, Enzymes & Nutrition, Enamel, Dentine & Craniofacial Development 3. Module III (12 Weeks): Neuroanatomy, Endocrine & Renal Physiology, Lipids & Vitamins, Pulp, Cementum, PDL, Oral Mucosa, Occlusion & TMJ
Phase II: Paraclinical Sciences & Pre-Clinical Dentistry	**Second Professional BDS**	1. Module IV (12 Weeks): Cell Injury, Acute Inflammation, Bacteriology, General Pharmacology, Dental Public Health, Science of Dental Gypsum & Waxes, Pre-Clinical Complete Denture Setup 2. Module V (12 Weeks): Hemodynamics, Neoplasia, Antimicrobial Pharmacology, Preventive Dentistry & Fluorides, Metals, Alloys & Ceramics, Elastomeric Impressions, Pre-Clinical Prosthodontic Processing 3. Module VI (12 Weeks): Immunology, Parasitology, Virology, Genetics, CNS/Endocrine Drugs, Dental Sociology & Biostatistics, Direct Restorative Materials (Amalgam, Composites, GIC), Pre-Clinical Phantom Head Operative Dentistry
Phase III: Clinical Dental Sciences & Hospital Postings	**Third Professional BDS**	1. Module VII (12 Weeks): Developmental Dental Anomalies, Dental Caries Pathology, Healthy Periodontium & Plaque, Oral Mucosal Diagnostics & Intraoral Radiology, Operative Caries Management, General Medicine (Cardiorespiratory & Rheumatology), General Surgery (Metabolic Response, Shock & Sepsis) 2. Module VIII (12 Weeks): Cysts of Jaws, Odontogenic Tumors, Periodontal Pockets, Premalignant Oral Lesions, RPD Biomechanics & Design, General Medicine (GIT, Hepatology, Nephrology & DM), General Surgery (Trauma

		Survey, Fractures & Head Injury) 3. Module IX (12 Weeks): Bone Pathologies, Non-Carious Tooth Loss, Furcation Lesions & GTR, Vesiculobullous Diseases, Salivary Pathologies, Minor Oral Surgery & Exodontia, General Medicine (Endocrinology, Neurology & Infections), General Surgery (Abdominal Viscera, Thyroid & Neck Swellings)
Phase IV: Advanced Clinical Clerkships & Multidisciplinary Patient Care	**Final Professional BDS**	1. Module X (12 Weeks): Advanced Operative & Rotary Endodontics, Fixed Prosthodontics & Removable Partial Dentures, Exodontia & Surgical Extractions, Diagnostic Orthodontics & Cephalometrics, Paediatric Preventive Dentistry. 2. Module XI (12 Weeks): Aesthetic Composite Restorations, Complete Denture Prosthetics & Occlusion, Maxillofacial Trauma & Surgical Sepsis, Preventive & Interceptive Orthodontics, Paediatric Pulp Therapy 3. Module XII (12 Weeks): Endodontic Retreatment & Periapical Surgeries, Maxillofacial Prosthetics & Dental Implants, Jaw Resections, Cleft Lip/Palate & Cysts/Tumors of OMFS, Fixed Orthodontic Mechanotherapy, Comprehensive Multidisciplinary Case Defense

6.1 Phase-Wise Narrative Breakdown

6.1.1 First Professional BDS (Modules I – III): Foundations of Biomedical & Dental Sciences

The first year establishes the essential biomedical foundations required for oral health professionals. Anatomy provides a complete regional understanding of the head and neck, cranial osteology, and neurovascular anatomy alongside general histology and embryology. Physiology details cellular mechanisms, cardiovascular hemodynamics, respiratory gas exchange, and neuromuscular regulation. Biochemistry illuminates biomolecular structures, bioenergetics, and metabolic pathways. Running concurrently, Oral Biology & Tooth Morphology introduces the microscopic structure of oral tissues, enamel, dentine, pulp, cementum, periodontal ligament, salivary glands, and the intricate morphology and carving of deciduous and permanent teeth.

6.1.2 Second Professional BDS (Modules IV – VI): Paraclinical Sciences & Pre-Clinical Dentistry

The second year acts as the critical bridge connecting basic science with operative intervention. General Pathology and Microbiology provide insights into cell death, inflammation, tissue healing, neoplasia, and infectious pathogens. Pharmacology and Therapeutics explores autonomic agents, analgesics, antimicrobials, and local anesthetics essential for dental prescription. Science of Dental Materials covers polymers, impression materials, metals, casting alloys, ceramics, and direct restorative materials. Community & Preventive Dentistry trains students in oral epidemiology,

preventive indices (DMFT, CPITN), public health fluoride regimens, and biostatistical fieldwork. Pre-clinical Phantom Head laboratories in Operative Dentistry and Prosthodontics cultivate early manual dexterity, cavity preparations, and denture processing.

6.1.3 Third Professional BDS (Modules VII – IX): Clinical Dental Sciences & General Hospital Medicine/Surgery

The third year marks the entry into clinical diagnosis and hospital medicine. In Oral Pathology, students investigate jaw cysts, odontogenic tumors, oral precancerous lesions, and bone disorders. Oral Medicine & Radiology covers mucosal disease diagnosis, vesiculobullous disorders, facial neuralgia, and radiographic interpretation. Periodontology addresses the etiology, pathogenesis, and clinical therapy of gingivitis and periodontitis. To produce holistic dental surgeons, students complete ward-based clinical postings in General Internal Medicine and General Surgery at Shahina Jamil Teaching Hospital and King Abdullah Teaching Hospital, learning history taking, emergency triage, systemic disease manifestations, perioperative stabilization, and shock management.

6.1.4 Final Professional BDS (Modules X – XII): Advanced Clinical Clerkships & Multidisciplinary Patient Care

The final professional year is an intensive, immersive clinical experience across five recognized dental disciplines: Operative Dentistry & Endodontics, Prosthodontics, Oral & Maxillofacial Surgery, Orthodontics, and Paediatric Dentistry. Students participate in supervised direct patient encounters in the dental outpatient departments, performing comprehensive treatment planning, rotary endodontics, fixed prosthodontics, exodontia and minor oral surgical procedures, orthodontic cephalometrics, and paediatric restorations, preparing them fully for internship and professional dental practice.

7.0 SUBJECT-WISE COURSE CONTENT

The BDS curriculum at Frontier Dental College complies with the syllabus, academic regulations, and assessment guidelines approved by Bahria University and the PMDC. Detailed course specifications for each subject encompass course rationale, descriptions, objectives, outcomes, instructional strategies, assessment methods, and recommended textbooks. The complete subject-wise study guides and module logs are maintained in departmental portfolios.

Course Title: Anatomy

Rationale

Anatomy provides the structural foundation for dental practice, clinical head and neck examination, local anesthesia delivery, surgical incision planning, and diagnostic radiographic interpretation. A comprehensive mastery of the intricate neurovascular and muscular architecture of the craniofacial region is essential for safe operative and oral surgical interventions.

Course Description:

1. The course covers general human anatomy, microscopic histology of bodily systems, systemic embryology with specialized emphasis on branchial arches, craniofacial morphogenesis, and advanced regional gross anatomy of the head and neck. Teaching involves interactive lectures, bone osteology demonstrations, histological slide microscopy, cadaveric prosections, and anatomical model examinations.
2. Describe the osteology of the skull, cranial fossae, foramina, and bones of the facial skeleton.
3. Identify the origins, insertions, actions, and nerve supply of the muscles of mastication and facial expression.
4. Trace the origin, course, branches, and distributions of the trigeminal (CN V), facial (CN VII), and remaining cranial nerves.
5. Describe the gross and microscopic anatomy of major salivary glands, tongue, palate, pharynx, larynx, and cervical triangles.
6. Explain the embryological development of pharyngeal arches, clefts, pouches, face, palate, and congenital craniofacial malformations.

Learning Objectives:

1. Correlate structural anatomy with surface landmarks for local anesthetic nerve blocks (inferior alveolar, mental, maxillary).
2. Demonstrate accurate anatomical terminology for craniofacial and cervical structures.
3. Interpret normal anatomical landmarks on skull radiographs, CT scans, and orthopantomograms (OPGs).
4. Correlate histological features of bodily tissues with physiological function and pathological alterations.

Learning Outcomes:

1. Apply detailed neurovascular head and neck knowledge to avoid iatrogenic trauma during dental and surgical procedures.

Textbooks & References:

1. Last's Anatomy: Regional and Applied (Chummy S. Sinnatamby)
2. Clinically Oriented Anatomy (Keith L. Moore, Arthur F. Dalley)
3. Head and Neck Anatomy for Dental Students (B. K. B. Berkovitz)
4. Langman's Medical Embryology (T. W. Sadler)
5. Wheater's Functional Histology: A Text and Colour Atlas (Young et al.)
6. Gray's Anatomy for Students (Richard Drake et al.)

Course Title: Physiology

Rationale:

Physiology provides the scientific foundation for understanding normal bodily functions, homeostasis, and regulatory mechanisms. Dental surgeons must comprehend systemic physiology to evaluate patient fitness for procedures, administer local/general anesthetics safely, and manage systemic emergencies.

Course Description:

1. This discipline explores cellular transport, neurophysiology, neuromuscular transmission, muscle contraction, blood and hemopoietic function, cardiovascular hemodynamics, pulmonary mechanics, renal excretion, gastrointestinal digestion, and endocrine regulation. Practical classes emphasize hematological testing, clinical nerve and reflex examinations, ECG interpretation, and vital signs monitoring.
2. Describe the mechanisms maintaining cellular homeostasis, resting membrane potential, and action potential propagation.
3. Explain the mechanics of cardiac contraction, cardiac cycle phases, ECG tracings, and blood pressure regulation.
4. Discuss hemostasis, coagulation cascades, fibrinolysis, blood grouping, and transfusion reactions.
5. Explain the physiology of pain transmission, nociceptive pathways, and mechanisms of local and systemic pain control.
6. Describe the physiology of saliva secretion, deglutition, mastication, and gastric digestion.

Learning Objectives:

1. Detail calcium and phosphate homeostasis, parathyroid hormone, calcitonin, and bone remodeling dynamics.
2. Measure blood pressure, radial pulse, and interpret normal ECG segments and intervals.
3. Perform basic hematology experiments including bleeding time, clotting time, hemoglobin estimation, and blood grouping.

Learning Outcomes:

1. Explain the physiological basis of systemic disease manifestations encountered during dental treatment.

Textbooks & References:

1. Guyton and Hall Textbook of Medical Physiology (John E. Hall)
2. Ganong's Review of Medical Physiology (Kim E. Barrett et al.)
3. Essentials of Medical Physiology (K. Sembulingam, Prema Sembulingam)

Course Title: Biochemistry

Rationale:

Medical Biochemistry elucidates the molecular and chemical basis of life, metabolism, genetics, and nutrition. In dentistry, biochemical concepts explain enamel mineralization, saliva buffering dynamics, dental plaque biochemistry, nutritional deficiencies, and endocrine disorders.

Course Description:

1. The course explores macromolecular structures, enzymology, bioenergetics, metabolic pathways of carbohydrates, lipids, proteins, and nucleotides, acid-base homeostasis, porphyrin synthesis, molecular genetics, and vitamin/mineral biochemistry. Laboratory sessions provide hands-on training in biochemical instrumentation, solution preparation, urine analysis, and spectrophotometry.
2. Explain the structural organization and biochemical roles of carbohydrates, proteins, lipids, and nucleic acids.
3. Describe enzyme kinetics, cofactors, regulatory mechanisms, diagnostic isoenzymes, and competitive/non-competitive inhibition.
4. Examine metabolic pathways including glycolysis, TCA cycle, glycogen metabolism, gluconeogenesis, and beta-oxidation.
5. Discuss the biochemical roles of calcium, phosphorus, magnesium, fluoride, and Vitamin D in hard tissue mineralization.
6. Explain acid-base balance, physiological buffer systems, Henderson-Hasselbalch equation, and saliva buffer capacity.

Learning Objectives:

1. Describe genetic transcription, translation, and molecular mechanisms underlying hereditary disorders.
2. Perform laboratory tests for carbohydrate, protein, and lipid identification, and clinical urine analysis.
3. Correlate nutritional and biochemical deficiencies (Vitamin C, D, Iron, Calcium) with oral tissue manifestations.

Learning Outcomes:

1. Apply biochemical knowledge to interpret blood glucose, lipid profile, and renal function test results.

Textbooks & References:

1. Harper's Illustrated Biochemistry (Victor W. Rodwell et al.)
2. Lippincott Illustrated Reviews: Biochemistry (Denise R. Ferrier)
3. Textbook of Biochemistry for Dental Students (DM Vasudevan, Sreekumari S.)

Course Title: Oral Biology & Tooth Morphology

Rationale:

Oral Biology and Tooth Morphology forms the core scientific discipline unique to dentistry. A precise understanding of dental anatomy, microscopic architecture of enamel, dentine, pulp, and periodontium, and craniofacial embryology is indispensable for diagnostic operative dentistry, endodontics, prosthodontics, and orthodontics.

Course Description:

1. Taught in the first year of the BDS program, this comprehensive course integrates oral embryology, oral histology, tooth development, tooth morphology, occlusion, and forensic odontology. Practical sessions focus on microscopic histological slide identification and carving anatomical teeth to scale on wax blocks.
2. Describe the anatomical landmarks, ridges, fossae, grooves, and pulp cavity dimensions of primary and permanent human teeth.
3. Explain the stages of tooth development (bud, cap, bell, root formation) and associated epithelial-mesenchymal interactions.
4. Detail the microscopic structure, chemical composition, incremental lines, and life cycles of enamel (amelogenesis) and dentine (dentinogenesis).
5. Describe the histological architecture of dental pulp, cementum, periodontal ligament, alveolar bone, and oral mucosa.
6. Explain the structure, innervation, secretion mechanisms, and functions of major and minor salivary glands.
7. Detail the functional anatomy and biomechanics of the temporomandibular joint (TMJ) and masticatory movements.

Learning Objectives:

1. Analyze primary and permanent occlusion, Angle's classification, compensating curves (Spee, Wilson), and forensic tooth identification.
2. Carve anatomical crowns and roots of incisors, canines, premolars, and molars accurately on wax blocks.
3. Identify histological sections of ground tooth, demineralized bone, enamel, dentine, pulp, cementum, PDL, and salivary glands.Apply universal, Palmer, and FDI tooth notation systems accurately in clinical documentation.

Learning Outcomes:

1. Correlate histological features of enamel and dentine with caries progression, operative cutting, and bonding techniques.

Textbooks & References:

1. Ten Cate's Oral Histology: Development, Structure, and Function (Antonio Nanci)
2. Wheeler's Dental Anatomy, Physiology and Occlusion (Stanley J. Nelson)
3. Orban's Oral Histology and Embryology (G. S. Kumar)
4. Illustrated Dental Embryology, Histology, and Anatomy (Margaret J. Fehrenbach)

Course Title: Science of Dental Materials

Rationale:

The clinical longevity and biological safety of dental restorations, prostheses, and surgical appliances depend on a rigorous understanding of dental materials. Dental surgeons must select, manipulate, and evaluate biomaterials based on their mechanical, thermal, optical, chemical, and biological properties.

Course Description:

1. This discipline covers the science, classification, manipulation, setting reactions, and biocompatibility of gypsum products, waxes, investment materials, denture polymers, metals and casting alloys, dental ceramics, elastomeric impression materials, direct filling materials (amalgams, composite resins, glass ionomers), and dental luting cements. Laboratory practicals provide hands-on experience in mixing, manipulation, casting, and polymer processing.
2. Explain mechanical properties (stress, strain, modulus of elasticity, resilience, hardness, creep, flow) and optical properties (hue, chroma, value).
3. Describe the chemical composition, classification, water-powder ratio, and setting reaction of gypsum products and dental waxes.
4. Detail the chemistry, manipulation, curing cycles, warpage, and porosities of heat-cure and cold-cure acrylic resins.
5. Discuss noble casting golds, base metal alloys (Co-Cr, Ni-Cr), titanium, and wrought stainless steel wires used in dentistry.
6. Classify elastic (alginates, addition/condensation silicones, polyethers) and non-elastic impression materials and their handling.
7. Explain the composition, setting reaction (gamma phases), and mercury hygiene of dental amalgams.
8. Analyze the chemistry of resin-based composites, filler technologies, acid-etch technique, dentine bonding agents, and light-curing dynamics.

Learning Objectives:

1. Discuss glass ionomer cements (GIC), resin-modified GIC, compomers, zinc phosphate, and zinc oxide eugenol cements.
2. Demonstrate proper proportioning, spatulation, and manipulation of dental plaster, stone, alginates, and elastomers without air entrapment.
3. Fabricate acrylic resin test specimens and handle dental waxes with proper temperature control.
4. Select appropriate restorative materials, bonding systems, and luting cements based on clinical cavity design and patient requirements.

Learning Outcomes:

1. Implement mercury hygiene protocols and occupational safety measures in the dental operatory.

Textbooks & References:

1. Phillips' Science of Dental Materials (Kenneth J. Anusavice, Chiayi Shen, H. Ralph Rawls)
2. Introduction to Dental Materials (Richard van Noort)
3. Dental Materials: Properties and Manipulation (John M. Powers, John C. Wataha)

Course Title: General Pathology & Microbiology

Rationale:

Pathology and Microbiology bridge basic biomedical sciences and clinical dental practice. An understanding of cellular responses, inflammation, hemodynamic alterations, neoplasia, and microbial virulence is fundamental for diagnosing oral disease, managing hospital-acquired infections, and prescribing rational antimicrobial therapy.

Course Description:

1. The course encompasses general pathology (cell injury, necrosis, apoptosis, acute/chronic inflammation, wound healing, hemodynamic disorders, shock, thrombosis, neoplasia) and systemic microbiology (bacteriology, virology, mycology, parasitology, and clinical immunology). Laboratory sessions focus on microscope slide analysis, Gram staining, culture media preparation, antibiotic sensitivity testing, and gross specimen examination.
2. Differentiate mechanisms of reversible and irreversible cell injury, necrosis types, and apoptosis.
3. Describe vascular and cellular events in acute inflammation, chemical mediators, and chronic granulomatous inflammation.
4. Explain primary and secondary wound healing and systemic factors influencing tissue repair.
5. Discuss thrombosis, embolism, infarction, shock, and fluid-electrolyte disturbances.
6. Classify benign and malignant neoplasms, molecular carcinogenesis, tumor markers, and staging/grading systems.
7. Describe medically important Gram-positive and Gram-negative bacteria, spirochetes, and antibiotic resistance mechanisms.
8. Detail blood-borne viruses (HBV, HCV, HIV), herpes simplex, respiratory viruses, and COVID-19 infection control.

Learning Objectives:

1. Explain hypersensitivity reactions (Types I–IV), autoimmunity, transplant rejection, and immunodeficiency states.
2. Identify histological features of acute inflammation, chronic granulomas, necrosis, and malignancy under the light microscope.
3. Perform and interpret Gram staining, Ziehl-Neelsen staining, and antibiotic susceptibility tests.

Learning Outcomes:

1. Implement universal sterilization protocols, autoclave monitoring, and infection control to prevent cross-contamination in dental clinics.

Textbooks & References:

1. Robbins Basic Pathology (Vinay Kumar, Abul K. Abbas, Jon C. Aster)
2. Review of Medical Microbiology and Immunology (Warren Levinson)
3. Medical Microbiology (David Greenwood et al.)

Course Title: Pharmacology & Therapeutics

Rationale:

Safe and effective dental practice demands comprehensive knowledge of pharmacodynamics, pharmacokinetics, drug interactions, and therapeutics. Dental surgeons routinely prescribe analgesics, antibiotics, sedatives, and local anesthetics, while treating patients with complex systemic pharmacotherapies.

Course Description:

1. This discipline covers basic pharmacological principles, autonomic drugs, cardiovascular agents, central nervous system agents, antimicrobials, anti-inflammatory drugs (NSAIDs, opioids, steroids), autacoids, endocrine pharmacology, and dental-specific therapeutics. Practical exercises include prescription writing, drug calculations, dosage adjustments, and experimental drug evaluations.
2. Explain pharmacokinetic mechanisms (absorption, bioavailability, volume of distribution, metabolism, clearance) and pharmacodynamics.
3. Describe the pharmacology of cholinergic and adrenergic agonists and antagonists.
4. Detail the mechanisms, indications, side effects, and ceiling effects of NSAIDs, paracetamol, opioids, and glucocorticoids.
5. Classify antibacterial, antifungal, and antiviral agents; detail their spectrum, adverse reactions, and misuse-driven resistance.
6. Detail the pharmacology of local anesthetics (esters, amides), mechanism of action, vasoconstrictor benefits, and systemic toxicity (LAST).

Learning Objectives:

1. Explain general anesthetics, conscious sedation agents, benzodiazepines, and emergency resuscitation medications.
2. Write clear, legally compliant, and rational dental prescriptions for common odontogenic infections, pain, and inflammation.
3. Calculate pediatric and adult drug dosages and infusion rates accurately.
4. Identify adverse drug reactions and clinical drug-drug interactions, particularly with anticoagulants, antihypertensives, and antidiabetics.

Learning Outcomes:

1. Manage acute anaphylactic and toxic drug emergencies in the dental operatory.

Textbooks & References

: 1. Basic and Clinical Pharmacology (Bertram G. Katzung, Todd W. Vanderah)
2. Lippincott Illustrated Reviews: Pharmacology (Karen Whalen)
3. Pharmacology and Therapeutics for Dentistry (John A. Yagiela, Frank J. Dowd et al.)

Course Title: Community & Preventive Dentistry

Rationale:

Oral diseases are largely preventable public health challenges. Community and Preventive Dentistry equips future dental surgeons with the epidemiological, statistical, and preventive competencies necessary to assess population oral health needs, lead health promotion campaigns, and design equitable dental care delivery systems.

Course Description:

1. Taught in the second year, this course encompasses dental public health philosophy, Ottawa Charter health promotion, oral epidemiology, dental caries and periodontal disease indices, fluoride chemistry and delivery modes, Atraumatic Restorative Treatment (ART), pit and fissure sealants, biostatistics, survey design, and behavioral dentistry. Field trips to schools, community centers, and water treatment facilities provide authentic experiential learning.
2. Define dental public health, Primary Health Care principles (Alma-Ata), and the Ottawa Charter framework.
3. Explain epidemiological study designs (descriptive, cross-sectional, cohort, case-control, randomized controlled trials).
4. Describe the calculation and application of dental indices: DMFT, deft, plaque index (PI), gingival index (GI), and CPITN.
5. Detail the systemic and topical mechanisms of fluoride in caries prevention, fluoride toxicity, fluorosis indices, and defluoridation.
6. Discuss dietary counseling, sugar substitutes, chemical and mechanical plaque control, and caries risk assessment.
7. Formulate health education materials and biostatistical hypotheses using PICO frameworks and sample size determinations.

Learning Objectives:

1. Describe clinical governance, dental waste disposal, and cross-infection control regulations.
2. Conduct oral epidemiological surveys using WHO standard assessment forms and calibrate dental indices.
3. Apply topical fluorides, pit and fissure sealants, and perform Atraumatic Restorative Treatment (ART) on simulated/extracted teeth.
4. Design, execute, and analyze a community-based research project, compiling results into a publishable scientific report.

Learning Outcomes:

1. Demonstrate effective oral hygiene counseling and behavioral change communication to school children and community groups.

Textbooks & References:

1. Primary Preventive Dentistry (Norman O. Harris, Franklin García-Godoy)
2. Community Oral Health (Cynthia M. Pine, Rebecca V. Harris)
3. Park's Textbook of Preventive and Social Medicine (K. Park)
4. Essential Dental Public Health (Blánaid Daly et al.)

Course Title: Oral Pathology & Microbiology

Rationale:

Oral Pathology is the specialty discipline that investigates the causes, pathogenesis, clinical features, histological characteristics, and prognosis of oral, jaw, and craniofacial diseases. Precise diagnostic histopathology and clinicopathological correlation are vital for appropriate medical and surgical interventions.

Course Description:

1. Covered extensively in the third professional year, this course investigates developmental abnormalities of teeth and bones, odontogenic and non-odontogenic cysts, benign and malignant odontogenic tumors, oral precancerous lesions, oral squamous cell carcinoma (OSCC), salivary gland disorders, fibro-osseous lesions, and infectious mucosal ulcerations. Practical sessions emphasize slide diagnosis, OPG analysis, and biopsy interpretations.
2. Classify developmental disturbances of tooth number, size, shape, and structure (Amelogenesis/Dentinogenesis Imperfecta).
3. Detail the etiopathogenesis, radiological, and histological features of odontogenic cysts (Radicular, Dentigerous, OKC).
4. Describe the clinical behavior, radiological presentation, and microscopic patterns of Ameloblastoma, CEOT, and odontomes.
5. Explain epithelial dysplasia, etiopathogenesis, and clinical features of leukoplakia, erythroplakia, oral submucous fibrosis, and OSCC.
6. Classify salivary gland tumors; describe Pleomorphic Adenoma, Warthin's tumor, Mucoepidermoid Carcinoma, and Adenoid Cystic Carcinoma.
7. Discuss bone pathologies including Fibrous Dysplasia, Cherubism, Osteomyelitis, Osteosarcoma, and giant cell lesions.

Learning Objectives:

1. Differentiate infective, autoimmune, and vesiculobullous mucosal conditions under the microscope.
2. Identify histological features of major odontogenic cysts, Ameloblastoma, oral epithelial dysplasia, and OSCC on microscopic slides.
3. Correlate clinical presentation with radiological findings on panoramic and periapical radiographs to formulate differential diagnoses.

Learning Outcomes:

1. Formulate structured biopsy request forms and interpret histopathological reports for clinical decision-making.

Textbooks & References:

1. Cawson's Essentials of Oral Pathology and Oral Medicine (Roderick A. Cawson, Edward W. Odell)
2. Oral and Maxillofacial Pathology (Brad W. Neville, Douglas D. Damm, Carl M. Allen, Angela C. Chi)
3. Soames and Southam's Oral Pathology (J. V. Soames, J. C. Southam)

Course Title: Oral Medicine & Oral Radiology

Rationale:

Oral Medicine and Oral Radiology equips dental students to diagnose and medically manage non-surgical disorders affecting oral mucosal tissues, salivary glands, and the temporomandibular joint, while safely executing and interpreting dental and maxillofacial radiographic imaging.

Course Description:

1. Taught in the third year, this subject covers systemic disease manifestations in the oral cavity, recurrent aphthous stomatitis, oral lichen planus, vesiculobullous dermatoses (pemphigus, pemphigoid), orofacial pain syndromes, trigeminal neuralgia, TMJ dysfunctions, radiation physics, intra-oral radiographic techniques (bisecting angle, paralleling), extra-oral radiography (OPG, lateral cephalograms), and radiation protection protocols.
2. Perform systemic and comprehensive oral mucosal examinations and formulate differential diagnoses.
3. Diagnose and medically manage red and white mucosal lesions, recurrent oral ulcers, and candidal infections.
4. Examine the etiology, clinical manifestations, and therapy of trigeminal neuralgia, atypical facial pain, and Bell's palsy.
5. Evaluate Temporomandibular Joint Disorders (TMD), myofascial pain dysfunction syndrome, and disc displacements.
6. Explain radiation physics, X-ray generation, ALARA principles, radiation biology, and patient shielding.
7. Describe the techniques and positioning for bitewing, periapical, occlusal, and panoramic radiography.

Learning Objectives:

1. Manage medically compromised dental patients (cardiac, diabetic, hypertensive, bleeding disorders, renal failure, pregnant).
2. Take diagnostic periapical and bitewing radiographs using paralleling and bisecting angle techniques.
3. Identify normal anatomical landmarks, caries, periodontal bone loss, and periapical radiolucencies on OPGs and periapical films.
4. Prescribe and interpret hematological, serological, and radiographic investigations for oral medicine patients.

Learning Outcomes:

1. Implement dental management protocols for patients on anticoagulants, chemotherapy, or radiotherapy.

Textbooks & References:

1. Burket's Oral Medicine (Michael Glick et al.)
2. Essentials of Dental Radiography and Radiology (Eric Whaites, Nicholas Drage)
3. Oral Medicine (Crispian Scully)
4. Oral Radiology: Principles and Interpretation (Stuart C. White, Michael J. Pharoah)

Course Title: Periodontology

Rationale:

Periodontal diseases are among the most prevalent human afflictions and represent the primary cause of tooth loss in adults. Mastery of periodontal biology, pathogenesis, non-surgical therapy, and surgical regenerative techniques is essential for preserving the natural dentition.

Course Description:

1. The course explores the macro and microscopic anatomy of healthy periodontium, bacterial etiology of plaque biofilms, host immune-inflammatory response, classification of periodontal diseases (1999 & 2017 AAP/EFP), clinical pocket charting, non-surgical scaling and root planing, chemotherapeutic agents, trauma from occlusion, splinting, and periodontal flap surgery, gingivectomy, and Guided Tissue Regeneration (GTR).
2. Describe the microscopic and clinical characteristics of healthy gingiva, cementum, periodontal ligament, and alveolar bone.
3. Detail plaque biofilm formation, periopathogenic microorganisms (Red Complex), calculus mineralization, and host-microbe interactions.
4. Classify gingival and periodontal diseases and differentiate gingivitis from periodontitis.
5. Explain the histopathology, contents, true vs. false distinctions, and bone destruction patterns of periodontal pockets.
6. Detail the indications, contraindications, and procedures for non-surgical scaling and root planing (SRP).
7. Discuss surgical periodontal therapies including gingivectomy, modified Widman flap, crown lengthening, and frenectomy.

Learning Objectives:

1. Explain Guided Tissue Regeneration (GTR) concepts, bone grafts, membrane barriers, and systemic risk factors (diabetes, smoking).
2. Perform periodontal charting, measuring probing pocket depths, clinical attachment levels (CAL), mobility, and furcation involvements.
3. Execute supra-gingival and sub-gingival scaling and root planing using hand instruments (Gracey curettes) and ultrasonic scalers.
4. Formulate comprehensive periodontal therapy plans with recall intervals based on individual risk assessment.

Learning Outcomes:

1. Educate patients on plaque disclosing, interdental brushing, and modified Bass tooth brushing techniques.

Textbooks & References:

1. Carranza's Clinical Periodontology (Michael G. Newman, Henry Takei, Perry R. Klokkevold, Fermin A. Carranza)
2. Periodontology at a Glance (Valerie Clerehugh, Aradhna Tugnait, Robert J. Genco)
3. Clinical Periodontology and Implant Dentistry (Jan Lindhe, Niklaus P. Lang)

Course Title: General Medicine

Rationale:

Dental surgeons regularly treat patients suffering from acute or chronic medical conditions. Knowledge of internal medicine is critical to safely manage medically complex dental patients, recognize systemic disease signs in the oral cavity, avoid fatal pharmacological crises, and handle medical emergencies in the dental operatory.

Course Description:

1. Taught in the third year through lectures and supervised clinical rotations at Shahina Jamil Teaching Hospital and King Abdullah Teaching Hospital, this course encompasses cardiovascular disorders, respiratory diseases, gastrointestinal and hepatic illnesses, renal diseases, endocrinology, hematology, infectious diseases, and medical emergency management.
2. Discuss the presentation, investigation, and management of ischemic heart disease, angina, myocardial infarction, hypertension, and heart failure.
3. Describe respiratory illnesses: bronchial asthma, COPD, pneumonia, tuberculosis, and management of acute respiratory distress.
4. Explain gastrointestinal and hepatic conditions: GERD, peptic ulcer, hepatitis B/C, liver cirrhosis, portal hypertension, and bleeding risks.
5. Detail renal disorders: nephritic/nephrotic syndrome, acute and chronic kidney disease, and dental precautions for dialysis patients.
6. Explain endocrine diseases: Type 1 & 2 Diabetes Mellitus, diabetic ketoacidosis, hypoglycemia, thyroid disorders, and adrenal insufficiency.
7. Discuss hematological conditions: iron deficiency and megaloblastic anemias, leukemias, lymphomas, thrombocytopenia, and hemophilia.

Learning Objectives:

1. Formulate diagnostic and resuscitation protocols for medical emergencies: anaphylaxis, syncope, hypoglycemia, seizures, and cardiac arrest.
2. Elicit a comprehensive medical history and perform physical examination of the cardiovascular, respiratory, and abdominal systems.
3. Interpret basic diagnostic tests including CBC, ESR, blood glucose, urea/creatinine, liver function tests, viral serology, and ECG.

Learning Outcomes:

1. Recognize acute medical emergencies in the dental chair and initiate prompt life support (BLS, oxygen, IM adrenaline).

Textbooks & References:

1. Davidson's Principles and Practice of Medicine (Stuart H. Ralston et al.)
2. Kumar and Clark's Clinical Medicine (Parveen Kumar, Michael Clark)
3. Medical Problems in Dentistry (Crispian Scully)

Course Title: General Surgery

Rationale:

A solid grasp of general surgical principles—such as metabolic responses to trauma, wound healing, asepsis, shock, hemorrhage control, and oncological surgery—is essential for safe dental and maxillofacial surgical practice.

Course Description:

1. This third-year course integrates lectures with clinical postings in hospital surgical wards and operating suites. It covers surgical metabolism, shock, hemorrhage, blood transfusions, surgical infections, sterilization, burns, fractures, trauma surveys, neck swellings, thyroid lesions, salivary gland diseases, and plastic reconstructive principles.
2. Explain systemic metabolic and endocrine responses to surgical trauma, stress, and starvation.
3. Classify shock (hypovolemic, cardiogenic, septic, anaphylactic) and describe resuscitation protocols and fluid therapy.
4. Describe mechanisms of hemorrhage, surgical hemostasis, indications for blood and component transfusions, and transfusion reactions.
5. Explain sterilization techniques, operating theatre protocols, surgical scrub, asepsis, and hospital-acquired infection control.
6. Discuss the classification and management of acute and chronic wounds, ulcers, sinuses, fistulas, and surgical site infections.
7. Describe the evaluation of neck lumps, salivary gland enlargements, thyroid neoplasms, and cervical lymphadenopathy.

Learning Objectives:

1. Detail primary and secondary trauma surveys (ATLS principles), head injuries, chest injuries, and principles of fracture fixation.
2. Demonstrate surgical hand scrubbing, sterile gowning and gloving, and maintenance of the sterile field.
3. Perform basic surgical knot tying and suturing techniques (interrupted, continuous, mattress).

Learning Outcomes:

1. Assess surgical trauma patients using primary survey ABCDE protocols and manage acute surgical wounds.

Textbooks & References:

1. Bailey & Love's Short Practice of Surgery (P. Ronan O'Connell, Andrew W. McCaskie, Robert D. Sayers)
2. Browse's Introduction to the Symptoms & Signs of Surgical Disease (James A. Gossage et al.)
3. Principles and Practice of Surgery (O. James Garden et al.)

Course Title: Operative Dentistry & Endodontics

Rationale:

Operative Dentistry and Endodontics is central to dental practice, focusing on the diagnosis, prevention, and minimally invasive restoration of dental caries, non-carious hard tissue defects, pulpal disease, and aesthetic tooth disharmonies.

Course Description:

1. Spanning pre-clinical simulation in Year 2, clinical foundations in Year 3, and advanced clerkships in Final Year, this discipline encompasses cariology, cavity preparations (Black's and modern slot designs), amalgam, composite restorations, bonding agents, rubber dam isolation, vital pulp therapy, and root canal therapy (RCT).
2. Explain the etiopathogenesis, clinical diagnosis, and ICDAS classification of dental caries.
3. Describe principles of tooth preparation for amalgam, direct composite resins, and glass ionomer cements.
4. Detail rubber dam isolation armamentarium, placement methods, and field isolation benefits.
5. Explain pulp biology, pulpal inflammation pathways, and clinical differentiation of reversible vs. irreversible pulpitis.
6. Detail the steps of root canal therapy: access cavity preparation, working length determination, biomechanical preparation, and obturation.
7. Describe endodontic instruments (ISO hand files, rotary NiTi instruments, irrigants, sealers) and radiography techniques.

Learning Objectives:

1. Discuss aesthetic composite restorations, shade selection, finishing and polishing, and tooth bleaching procedures.
2. Prepare and restore Class I, II, III, IV, and V cavities on phantom head teeth and patients following biological principles.
3. Apply rubber dam isolation efficiently in clinical patient procedures.
4. Perform complete single and multi-rooted endodontic therapy safely under rubber dam isolation.

Learning Outcomes:

1. Diagnose and manage post-restorative complications, cracked teeth, and pulp-periapical pathologies.

Textbooks & References: 1. Sturdevant's Art and Science of Operative Dentistry (Harald O. Heymann et al.)

2. Cohen's Pathways of the Pulp (Kenneth M. Hargreaves, Louis H. Berman)
3. Pickard's Manual of Operative Dentistry (Avijit Banerjee, Timothy F. Watson)
4. Endodontics: Principles and Practice (Mahmoud Torabinejad, Richard E. Walton)

Course Title: Prosthodontics (Complete, Removable Partial & Fixed)

Rationale:

Prosthodontics focuses on restoring oral function, comfort, appearance, and patient health through the replacement of missing teeth and contiguous craniofacial tissues using biocompatible artificial substitutes.

Course Description:

1. Spanning pre-clinical laboratory work in Year 2 and extensive clinical rotations in Years 3 and 4, this course covers complete dentures, removable partial dentures (RPD), fixed partial dentures (crowns and bridges), dental occlusion, maxillofacial prosthetics, and implant dentistry.
2. Explain anatomical landmarks of edentulous maxillary and mandibular arches and border molding principles.
3. Describe laboratory and clinical steps for complete denture fabrication: primary impressions, custom trays, secondary impressions, occlusal rims, jaw relations, tooth setup, try-in, and processing.
4. Classify partially edentulous arches (Kennedy classification with Applegate's rules) and explain RPD biomechanics.
5. Design removable partial denture components: major connectors, minor connectors, rests and rest seats, direct retainers (clasps), and indirect retainers.
6. Detail principles of tooth preparation for full ceramic, metal-ceramic, and cast metal crowns and fixed partial dentures.
7. Explain impression techniques, temporary restoration fabrication, cementation protocols, and dental occlusion concepts.

Learning Objectives:

1. Discuss principles of dental implantology, osseointegration, and implant-supported prostheses.
2. Make accurate primary and master impressions using alginate, zinc oxide eugenol, and addition silicone materials.
3. Record accurate maxillo-mandibular relations (centric relation and vertical dimension) using wax occlusal rims.
4. Design cast partial denture frameworks and complete balanced tooth setups on semi-adjustable articulators.

Learning Outcomes:

1. Prepare abutment teeth for metal-ceramic crowns following biological, mechanical, and aesthetic preparation guidelines.

Textbooks & References:

1. Boucher's Prosthodontic Treatment for Edentulous Patients (George A. Zarb et al.)
2. McCracken's Removable Partial Prosthodontics (Alan B. Carr, David T. Brown)
3. Contemporary Fixed Prosthodontics (Stephen F. Rosenstiel, Martin F. Land, Robert R. Fujimoto)
4. Fundamentals of Fixed Prosthodontics (Herbert T. Shillingburg et al.)

Course Title: Oral & Maxillofacial Surgery

Rationale:

Oral and Maxillofacial Surgery (OMFS) encompasses the diagnosis and surgical and adjunctive management of diseases, injuries, and defects involving both the functional and aesthetic aspects of the hard and soft tissues of the oral and maxillofacial region.

Course Description:

1. Taught in Years 3 and 4 through outpatient clinics, emergency rotas, and operating theatre postings, this discipline includes exodontia, surgical removal of impacted teeth, odontogenic infections and fascial space abscesses, maxillofacial trauma, cysts and tumors of the jaws, pre-prosthetic surgery, TMJ surgery, orthognathic surgery, and local/general anesthesia.
2. Describe the pharmacology, techniques, anatomical landmarks, and complications of local anesthesia in the oral cavity.
3. Detail forceps and elevator mechanics, indications, and procedures for routine and surgical exodontia.
4. Classify impacted mandibular third molars (Pell & Gregory, Winter) and describe surgical removal techniques.
5. Explain the diagnosis, fascial space anatomy, airway compromise, and surgical management of Ludwig's angina and cellulitis.
6. Detail the etiology, classification, clinical signs, and fixation methods for mandible, maxilla (Le Fort), and zygomatic fractures.
7. Describe surgical approaches for enucleation, marsupialization, and resection of odontogenic cysts and tumors.

Learning Objectives:

1. Discuss TMJ internal derangements, ankylosis, and principles of pre-prosthetic and implant surgical procedures.
2. Administer inferior alveolar nerve, lingual nerve, and long buccal nerve blocks, as well as maxillary infiltration anesthesia safely.
3. Perform uncomplicated and complex dental extractions safely without damaging adjacent teeth or tissues.
4. Manage common post-extraction complications: hemorrhage, dry socket (alveolar osteitis), and root displacement.

Learning Outcomes:

1. Perform surgical incision, flap reflection, bone gutters, tooth sectioning, and suturing for impacted teeth on models/under supervision.

Textbooks & References:

1. Contemporary Oral and Maxillofacial Surgery (James R. Hupp, Edward Ellis III, Myron R. Tucker)
2. Peterson's Principles of Oral and Maxillofacial Surgery (Michael Miloro et al.)
3. Handbook of Local Anesthesia (Stanley F. Malamed)
4. Extraction of Teeth (Geoffrey L. Howe)

Course Title: Orthodontics

Rationale:

Orthodontics addresses the supervision, guidance, and correction of the growing and mature dentofacial structures. Understanding craniofacial growth, occlusal development, and biomechanical tooth movement is necessary to diagnose malocclusions and intercept developing dental irregularities.

Course Description:

1. Taught in the final year, the orthodontic curriculum encompasses craniofacial growth, occlusion development, malocclusion classification (Angle's, British Standards), clinical orthodontic examination, cephalometric analysis, biological tooth movement, preventive and interceptive orthodontics, removable orthodontic appliances, and principles of fixed appliance therapy.
2. Explain postnatal craniofacial growth theories, sites of growth, and developmental timing.
3. Describe stages of occlusal development from the primary dentition to the permanent dentition.
4. Classify malocclusions according to Angle's molar classification, incisor classifications, and skeletal discrepancy patterns.
5. Explain the biology of tooth movement, tissue changes under pressure and tension, and orthodontic force dynamics.
6. Describe components, design, and active elements (springs, screws) of removable orthodontic appliances.
7. Detail the principles of preventive and interceptive orthodontics: space maintainers, habit-breaking appliances, and serial extractions.

Learning Objectives:

1. Introduce cephalometric landmarks, planes, angular measurements (SNA, SNB, ANB), and fixed orthodontic brackets and wires.
2. Perform comprehensive extra-oral facial assessments (profiles, asymmetry, lip competence) and intra-oral orthodontic exams.
3. Trace lateral cephalometric radiographs, identify standard landmarks, and interpret skeletal Class I, II, and III relationships.
4. Design and manage simple removable appliances for minor tooth movements and space maintenance in children.

Learning Outcomes:

1. Identify malocclusions requiring specialist referral and counsel patients on orthodontic treatment timing.

Textbooks & References:

1. Contemporary Orthodontics (William R. Proffit, Henry W. Fields, Brent E. Larson, David M. Sarver)
2. An Introduction to Orthodontics (Laura Mitchell)
3. Orthodontics: Current Principles and Techniques (Lee W. Graber et al.)

Course Title: Paediatric Dentistry

Rationale:

Children present distinct psychological, physiological, and dental considerations compared to adults. Paediatric Dentistry equips students with the specialized skills required to deliver preventive, interceptive, and restorative oral care to infants, children, adolescents, and children with special healthcare needs.

Course Description:

1. This final-year course covers child development, behavioral management techniques (pharmacological and non-pharmacological), preventive therapies (fluorides, sealants, diet), restorations in primary teeth, pulpotomy and pulpectomy, space maintenance, traumatic dental injuries in primary/young permanent teeth, and management of children with special healthcare needs.
2. Describe physical, emotional, and cognitive development in pediatric patients and child dental psychology.
3. Detail non-pharmacological behavior management strategies: Tell-Show-Do, positive reinforcement, distraction, voice control.
4. Discuss early childhood caries (ECC) etiology, risk assessment, prevention, and parent counseling.
5. Describe cavity preparation designs for primary molars and preformed stainless steel crown restorations (Hall technique).
6. Explain pulpal therapies in primary teeth: indirect pulp capping, formocresol/MTA pulpotomy, and pulpectomy.
7. Detail space maintainers (band and loop, lingual arch, distal shoe) indications and fabrication.

Learning Objectives:

1. Classify and manage traumatic dental injuries in primary and young permanent teeth, including avulsion and apexification protocols.
2. Establish positive communication and apply behavior guidance techniques during child dental examinations.
3. Perform pulpotomies, primary tooth restorations, and stainless steel crown adaptations on typodont models/patients.
4. Design and deliver tailored preventive care plans, caries risk assessments, and topical fluoride applications for pediatric patients.

Learning Outcomes:

1. Manage acute pediatric dental trauma according to current International Association of Dental Traumatology (IADT) guidelines.

Textbooks & References:

1. Dentistry for the Child and Adolescent (Jeffrey A. Dean)
2. Pediatric Dentistry: Infancy through Adolescence (Arthur J. Nowak et al.)
3. Paediatric Dentistry (Richard Welbury, Monty S. Duggal, Marie-Thérèse Hosey)

Course Title: Behavioral Sciences

Rationale:

Behavioral Sciences provide future dental surgeons with an understanding of psychological, socio-cultural, and behavioral determinants of health, dental anxiety, pain perception, and communication, fostering empathetic, patient-centered clinical care.

Course Description:

1. Taught longitudinally across the BDS program, this course covers the doctor-patient relationship, dental fear and phobia assessment and management, stress and burnout in dental practitioners, breaking bad news, medical ethics, patient rights, and psycho-social aspects of chronic orofacial pain.
2. Understand theories of personality, learning, perception, and human behavioral development.
3. Identify psychological factors influencing dental anxiety, phobia, and pain perception.
4. Demonstrate communication skills for patient interviewing, counseling, and crisis de-escalation.
5. Discuss socio-cultural determinants of health and equitable access to dental care.

Learning Objectives:

1. Apply ethical principles in complex clinical situations involving patient autonomy, consent, and confidentiality.
2. Elicit psychosocial patient histories and assess dental anxiety using validated scales (Modified Dental Anxiety Scale).
3. Apply non-pharmacological anxiety reduction and relaxation techniques in clinical patient encounters.

Learning Outcomes:

1. Communicate complex treatment options and informed consent respectfully to diverse patient groups.

Textbooks & References: 1. Behavioral Sciences: A Guide for Medical Students & Professionals (Mowadat H. Rana)
2. Behavioral Dentistry (David Mostofsky et al.)
3. The Doctor's Communication Handbook (Peter Tate)

Course Title: The PLACE Module (Professionalism, Leadership, Applied Research, Communication & Ethics)

Rationale:

Contemporary dental practice requires competencies that extend beyond technical motor skills. The PLACE Framework is a longitudinal cornerstone of the BDS curriculum, cultivating mature professional identity, clinical ethics, leadership capacity, communication acumen, and research capability across all academic years.

Course Description:

1. The PLACE module integrates five core pillars throughout the undergraduate dental journey: Professionalism, Leadership, Applied Research, Communication Skills, and Ethics. Learning formats include case deliberations, mock ethical tribunals, leadership workshops, quality improvement audits, research synopsis development, and reflective portfolio compilation.
2. Model ethical accountability, integrity, and lifelong learning commitment in academic and clinical endeavors.
3. Apply healthcare leadership, resource management, operatory ergonomics, and quality improvement principles within dental teams.
4. Formulate research questions, write structured study protocols, perform statistical analysis, and critically appraise scientific literature.
5. Demonstrate advanced communication skills for obtaining informed consent, managing difficult clinical interviews, and resolving patient conflicts.

Learning Objectives:

1. Analyze complex clinical ethical dilemmas (patient refusal of care, disclosure of iatrogenic errors, confidentiality limits) using structured ethical frameworks.
2. Maintain a continuous reflective learning portfolio demonstrating clinical growth and professional self-care.
3. Complete and defend an undergraduate scientific research synopsis aligned with PMDC and university research guidelines.

Learning Outcomes:

1. Articulate a justified ethical resolution for complex clinical dental dilemmas in accordance with universal ethical principles and Pakistani law.

Textbooks & References:

1. Teaching Medical and Dental Professionalism (Richard L. Cruess et al.)
2. Clinical Ethics: A Practical Approach (Albert R. Jonsen et al.)
3. How to Read a Paper: The Basics of Evidence-Based Medicine and Healthcare (Trisha Greenhalgh)
4. Dental Ethics at Chairside: Professional Principles and Practical Applications (David T. Ozar, David J. Sokol)

Course Title: Quran Kareem (Tajweed, Tafseer & Seerat)

Rationale:

The Quran Kareem curriculum nurtures spiritual, moral, and character development, reinforcing foundational values of compassion, honesty, modesty, accountability, and selfless service to humanity essential for healthcare practitioners.

Course Description:

1. Delivered longitudinally across the BDS program in accordance with regulatory requirements, this course covers correct Quranic recitation with Tajweed, thematic Tafseer of selected Surahs, and reflections on the life of Prophet Muhammad (PBUH) (Seerat-un-Nabi) as a model of ethical conduct, compassion, and human service.
2. Recite selected verses of the Holy Quran following Tajweed rules of pronunciation.
3. Understand the core themes, linguistic meanings, and guidance of the selected Surahs.
4. Connect Islamic moral teachings on healing, empathy, truthfulness, and justice with modern healthcare ethics and patient care.

Learning Objectives:

1. Reflect upon the Prophet's (PBUH) interpersonal character and apply ethical principles in clinical interactions.
2. Demonstrate accurate recitation and deep understanding of the studied Quranic passages.
3. Articulate how Islamic ethical teachings guide honest, compassionate, and patient-centered healthcare delivery.

Learning Outcomes:

1. Demonstrate integrity, humility, and moral excellence in professional interactions with patients and colleagues.
2.

Textbooks & References:

1. The Holy Quran (Arabic Text with Urdu/English Translation and Commentary)
   2. Towards Understanding the Quran (Sayyid Abul A'la Maududi)
   3. The Sealed Nectar (Ar-Raheeq Al-Makhtum) by Safi-ur-Rahman al-Mubarakpuri

Course Title: Pakistan Studies & Islamic Studies / Ethics

Rationale:

These courses cultivate an informed sense of national identity, historical consciousness, constitutional civic responsibility, and moral grounding, providing students with insight into the socio-political and cultural context of healthcare delivery in Pakistan.

Course Description:

1. Pakistan Studies examines the historical roots of the Pakistan Movement, constitutional milestones, geography, foreign policy, and contemporary socio-economic healthcare challenges. Islamic Studies (or Ethics for non-Muslim students) explores fundamental beliefs (Aqeedah), worship (Ibadat), ethical codes, human rights, and social justice.
2. Trace the historical landmarks leading to the creation of Pakistan and examine national constitutional frameworks.
3. Analyze the contemporary socio-economic, regional, and healthcare challenges facing Pakistan.
4. Detail the fundamental beliefs, moral code, and social obligations of Islam (or universal moral philosophy for non-Muslim students).

Learning Objectives:

1. Explore the historical contributions of Muslim scholars to science, medicine, and human civilization.
2. Articulate an informed perspective on national identity and civic duties as healthcare professionals.

Learning Outcomes:

1. Apply ethical principles of honesty, social justice, tolerance, and empathy in clinical and community healthcare practice.

Textbooks & References:

1. Pakistan Studies (M. Ikram Rabbani)
2. The Struggle for Pakistan (I. H. Qureshi)
3. Introduction to Islam (Dr. Muhammad Hamidullah)
4. Ethics for Healthcare Professionals (Academic text for non-Muslim students)

8.0 CURRICULUM HOUR DISTRIBUTION

The BDS curriculum at Frontier Dental College complies with the Contact hour requirements, clinical training allocations, and credit hour frameworks established by Bahria University and approved by the Pakistan Medical and Dental Council (PMDC). The curriculum provides a balanced distribution across didactic instruction, laboratory practicals, pre-clinical phantom head simulation, and clinical chairside patient encounters across the four professional years.

The table below details the official subject-wise and year-wise distribution of contact hours across the four-year BDS program (totalling 4,860 formal curricular hours, supplemented by 200 mandatory co-curricular hours):

FRONTIER MEDICAL & DENTAL COLLEGE

CONTACT HOURS DISTRIBUTION IN 1st YEAR BDS (SESSION: ACADEMIC YEAR 2026)

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
1	First Professional BDS	Anatomy (Gross, Histology, Embryology, Head & Neck)	168	132	300
2	First Professional BDS	Physiology	168	132	300
3	First Professional BDS	Medical Biochemistry	114	66	180
4	First Professional BDS	Oral Biology & Tooth Morphology	168	132	300
5	First Professional BDS	Pakistan Studies & Islamic Studies / Ethics	50	0	50
6	First Professional BDS	Behavioral Sciences	70	0	70
7	First Professional BDS	Quran Kareem / Fehm-e-Quran	20	0	20
Subtotal | Year 1 Subtotal		**[758 Theory / 462 Practical]**	**758**	**462**	**1220**

FRONTIER MEDICAL & DENTAL COLLEGE

CONTACT HOURS DISTRIBUTION (SESSION: ACADEMIC YEAR 2026)

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
1	Second Professional BDS	General Pathology & Microbiology	154	66	220
2	Second Professional BDS	Pharmacology & Therapeutics	154	66	220
3	Second Professional BDS	Science of Dental Materials	168	132	300
4	Second Professional BDS	Community & Preventive Dentistry	134	66	200
5	Second Professional BDS	General Pathology & Microbiology	154	66	220
	Second Professional BDS	Pharmacology & Therapeutics	154	66	220
	Second Professional BDS	Science of Dental Materials	168	132	300
6	Second Professional BDS	Community & Preventive Dentistry	134	66	200
	Second Professional BDS	Pre-Clinical Prosthodontics (Lab / Skills)	0	80	80
7	Second Professional BDS	Pre-Clinical Operative Dentistry (Phantom Lab)	0	80	80
	Second Professional BDS	Behavioral Sciences & Research Methodology	100	0	100
8	Second Professional BDS	Quran Kareem / Fehm-e-Quran	20	0	20
Subtotal | Year 2 Standalone		**[730 Theory / 490 Practical]**	**730**	**490**	**1220**

FRONTIER MEDICAL & DENTAL COLLEGE

CONTACT HOURS DISTRIBUTION IN 3rd YEAR BDS (SESSION: ACADEMIC YEAR 2026)

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
1	Third Professional BDS	Oral Pathology & Microbiology	114	66	180
2	Third Professional BDS	Oral Medicine & Radiology	84	66	150
3	Third Professional BDS	Periodontology	114	66	180
4	Third Professional BDS	General Medicine (Ward Postings & Clinics)	71	99	170
5	Third Professional BDS	General Surgery (Ward Postings & OT)	81	99	180
6	Third Professional BDS	Clinical Prosthodontics	14	66	80
7	Third Professional BDS	Clinical Operative Dentistry	14	66	80
8	Third Professional BDS	Pre-Clinical Oral & Maxillofacial Surgery	14	66	80
9	Third Professional BDS	Behavioral Sciences & Ethics	100	0	100
10	Third Professional BDS	Quran Kareem / Fehm-e-Quran	20	0	20
Subtotal | Year 3 Subtotal		**[626 Theory / 594 Clinical/Lab]**	**626**	**594**	**1220**

FRONTIER MEDICAL & DENTAL COLLEGE

CONTACT HOURS DISTRIBUTION IN FINAL YEAR BDS (SESSION: ACADEMIC YEAR 2026)

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
1	Final Professional BDS	Operative Dentistry & Endodontics (Clinics) 	66	184	250
2	Final Professional BDS	Prosthodontics (Clinics) 	66	184	250
3	Final Professional BDS	Oral & Maxillofacial Surgery (Clinics & OT) 	66	184	250
4	Final Professional BDS	Orthodontics (Clinics & Cephalometrics) 	66	184	250
5	Final Professional BDS	Paediatric Dentistry 	60	40	100
5	Final Professional BDS	Behavioral Sciences, PLACE & Leadership 	100	0	100
6	Final Professional BDS	Behavioral Sciences, PLACE & Leadership 	100	0	100
Subtotal | Final Year Subtotal		**[424 Theory / 776 Clinical]** 	**424**	**776**	**1200**

FRONTIER MEDICAL & DENTAL COLLEGE

COMPLETE FOUR-YEAR BDS CURRICULAR HOURS DISTRIBUTION (SESSION: ACADEMIC YEAR 2026)

TABLE 1: FIRST YEAR BDS - CONTACT HOURS DISTRIBUTION

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
1	First Professional BDS	Anatomy (Gross, Histology, Embryology, Head & Neck)	168	132	300
Subtotal | Year 1 Subtotal		**[758 Theory / 462 Practical]**	**758**	**462**	**1220**

TABLE 2: SECOND YEAR BDS - CONTACT HOURS DISTRIBUTION

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
2	Second Professional BDS	General Pathology & Pharmacology & Therapeutics	154	66	220
Subtotal | Year 2 Stantalone		**[730 Theory / 490 Practical]**	**730**	**490**	**1220**

TABLE 3: THIRD YEAR BDS - CONTACT HOURS & DISTRIBUTION

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
3	Third Professional BDS	Oral Pathology & General Surgery (Ward Postings & OT)	71	99	170
Subtotal | Yearr 3 Subtotal		**[626 Theory / 594 Clinicall]**	**626**	**594**	**1220**

TABLE 4: FINAL YEAR BDS - CONTACT HOURS DISTRIBUTION

Sr.	Professional Year	Subject / Component	Theory (Hrs)	Practical/Clinical	Total Hours
1	Final Professional BDS	Operative Dentistry, Prosthodontics (Clinics)	66	184	250
6	Final Professional BDS	Behavioral Sciences, PLACE & Leadership	100	0	100
Subtotal | Final Year Subtotal		**[424 Theory / 776 Clinical]**	**424**	**776**	**1200**
Total | Grand Total Curricular Hours | Formal Four-Year BDS Program			**2,538**	**2,322**	**4,860**

8.3 Extracurricular & Co-Curricular Activities

A total of 200 hours across the four-year program are dedicated to mandatory extracurricular and co-curricular programs designed to promote teamwork, physical wellness, cultural enrichment, and leadership:

8.3.1 Annual Sports Gala: One full week dedicated to athletics, cricket, football, table tennis, and badminton competitions.

8.3.2 Cultural and Literary Shows: Three days of debate competitions, drama, and national cultural showcases.

8.3.3 Research Poster Competition: FDC also arranges the poster competition in the concerned departments.

8.3.4 Hiking and Outdoor Camping: Three days exploring Abbottabad's pine hills to build resilience and outdoor leadership.

8.3.4 Student Research Conferences & Dental Expos: Annual undergraduate scientific presentations and poster competitions.

8.3.5 Community Dental Outreach Campaigns: Supervised free dental screening and hygiene awareness camps in rural Khyber Pakhtunkhwa.

3d Model Competition

9.0 CLINICAL ROTATIONS & CLERKSHIPS

Clinical education is the core pillar of the dental training program at Frontier Dental College. It provides students with progressive, closely supervised opportunities to translate preclinical theoretical knowledge into chairside clinical competencies, empathetic patient communication, diagnostic reasoning, and procedural mastery.

9.1 Clinical Training Framework & Teaching Hospital

Clinical dental instruction is conducted across purpose-built facilities:

Frontier Dental Hospital Outpatient Departments: Dedicated specialized clinical operatories in Operative Dentistry & Endodontics, Prosthodontics, Oral & Maxillofacial Surgery, Orthodontics, Periodontology, Paediatric Dentistry, and Oral Diagnostics/Medicine.
Shahina Jamil Teaching Hospital (SJTH), Abbottabad: On-campus 250+ bed teaching hospital for inpatient care, emergency medicine, general surgery operating suites, and medical ward rotations.

9.2 Clinical Rotation Matrix: Third Professional BDS

Third-year BDS students are divided into four sequential clinical batches (Batches A, B, C, and D) rotating through clinical dental departments and hospital medical/surgical wards over 8-week blocks:

ROTATIONS FROM	TO	PERIODONTOLOGY	ORAL MEDICINE	ORAL SURGERY	OPERATVE DENTISTRY	ORAL PATHOLOGY	PROSTHODONTICS
17-2-25	28-3-25	A1	A2	B1	B2	C1	C2
29-3-25	6-5-25	A2	A1	B2	B1	C2	C1
7-5-25	14-6-25	B1	B2	C1	C2	A1	A2
15-6-25 25	30-6-25	SUMMER VACCATIONS					
1-7-25	8-8-25	B2	B1	C2	C1	A2	A1
9-8-25	17-9-25	C1	C2	A1	A2	B1	B2
18-9-25	27-10-25	C2	C1	A2	A1	B2	B1

Students Groups

A1 - R# - 22001 TO R# 22009 (9 STUDENTS) A2 - R#- 22010 TO 22017 (8 STUDENTS)

B1 - R# - 22018 TO R# 22026 (9 STUDENTS) B2 - R#- 22027 TO 22034 (8 STUDENTS)

C1 - R# 22034 TO R# 22042 (9 STUDENTS) C2 - R# 22043- 22050 And R# 21004 (8 STUDENTS

9.3 Advanced Clinical Clerkships Matrix: Final Professional BDS

Final-year BDS students complete comprehensive, patient-centered clinical clerkships rotating sequentially across five specialized dental departments. Each student must fulfill minimum clinical procedural quotas under direct faculty supervision:

ROTATIONS	SPECIALITY FROM	TO	DEPARTMENT OF PROSTHODONTICS	DEPARTMENT OF ORTHODONTICS	DEPARTMENT OF OPERATIVE DENTISTRY/PEADS	DEPARTMENT OF OMF SURGERY
R1	17-2-25	17-4-25	A	B	C	D
R2	18-4-25	3-7-25	B	A	D	C
	15-6-25	30-6-25	SUMMER VACCATIONS			
R3	4-7-25	4-9-25	C	D	A	B
R4	5-9-25	5-11-25	D	C	B	A

GROUP A - R # 21001, 21002, 21003, 21005, 21006, 21007, 21008, 21009, 21010, 21014

GROUP B - R # 21015, 21016, 21017, 21018, 21019, 21020, 21022, 21023, 21026, 21027

GROUP C - R # 21028, 21029, 21030, 21032, 21033, 21034, 21035, 21036, 21037

GROUP D - R # 21038, 21039, 21040, 21041, 21042, 21043, 21044, 21045, 21046

9.4 Clinical Logbooks and Reflective Learning

Every BDS student maintains an official clinical logbook throughout the clinical years. The logbook documents every completed patient interaction, including diagnostic workups, preventive procedures, cavity preparations, endodontic treatments, crown preps, RPD designs, extractions, and pediatric treatments. Faculty sign each procedure upon real-time verification. Students regularly complete reflective critical incident analyses to document personal insights and areas for technical improvement.

9.5 Workplace-Based Assessment (WPBA)

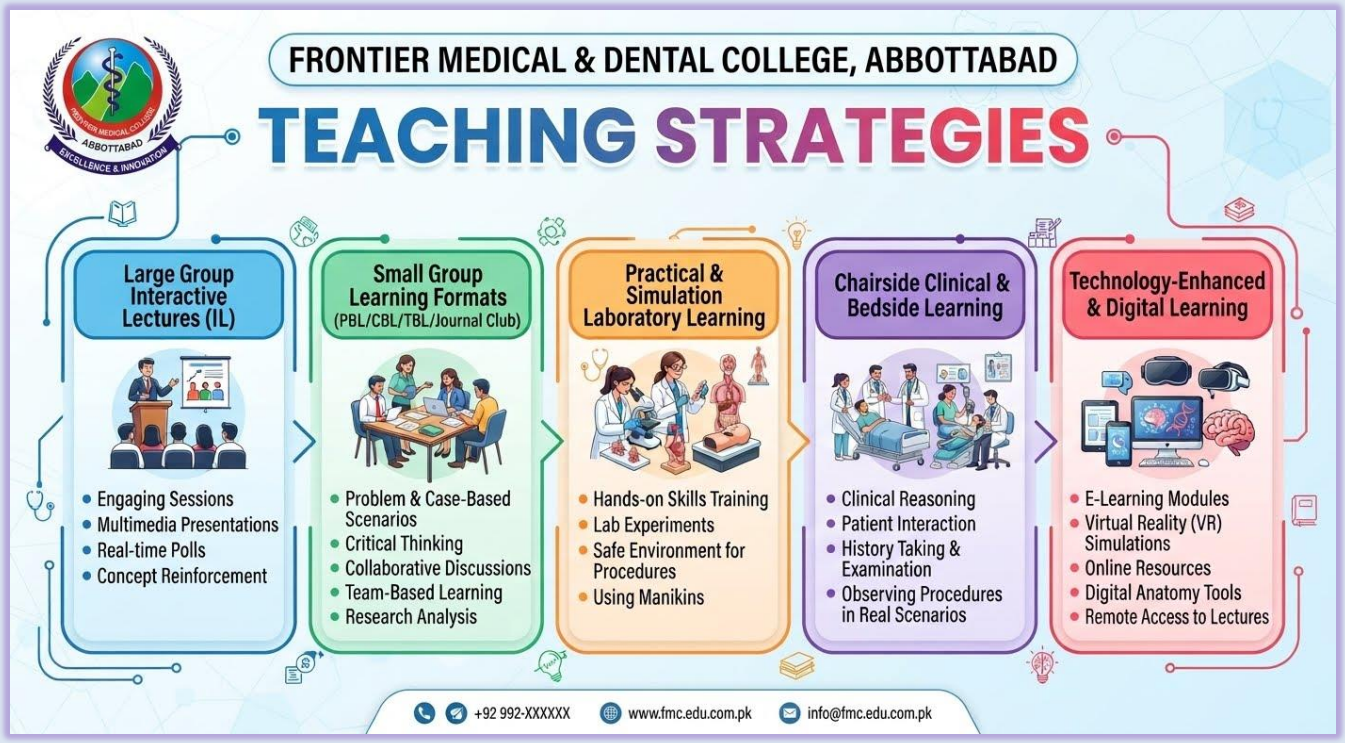
Clinical competence is systematically evaluated using validated workplace-based assessment tools:

1. **Mini-Clinical Evaluation Exercise (Mini-CEX):** 15-minute chairside observations assessing history-taking, diagnostic examination, patient communication, and professionalism.
2. **Direct Observation of Procedural Skills (DOPS):** Structured evaluations of specific procedural competencies (such as inferior alveolar nerve block, rubber dam application, rotary root canal preparation, or surgical tooth extraction) followed by immediate feedback.

3. **Case-Based Discussion (CBD):** Comprehensive reviews of student clinical case notes, diagnostic radiographs, and treatment plans to evaluate clinical reasoning and treatment justification.

10.0 TEACHING STRATEGIES

The BDS program employs diverse teaching methodologies tailored to develop the knowledge, clinical skills, and professional values of students:



10.1 Large Group Interactive Lectures (IL)

Interactive lectures introduce core concepts and theoretical foundations. Faculty use clinical case triggers, audience response questions, and short diagnostic exercises to engage students and encourage critical inquiry.

10.2 Small Group Learning Formats

Problem-Based Learning (PBL): Small groups of 8–10 students work through authentic clinical scenarios using the Maastricht 7-jump model under faculty facilitation to formulate hypotheses and identify learning objectives.

Case-Based Learning (CBL) and PSIL: Clinical cases are examined to practice diagnostic pathways, investigate systemic disease interactions, and plan complex oral rehabilitation.

Team-Based Learning (TBL): Structured collaborative learning sessions incorporating Individual **Readiness Assurance Tests (IRAT) and Group Readiness Assurance Tests (GRAT).**

Journal Club: Critical appraisal sessions evaluating contemporary scientific literature and clinical trials.

Practical & Simulation Laboratory Learning

Biomedical Laboratories: Hands-on histology slide analysis, anatomical dissection/prosection, hematological investigations, and biochemical experiments.

Pre-Clinical Phantom Head Simulation: Manikin heads with articulated dental arches replicate chairside ergonomics, water coolant management, rotary tooth preparations, matrix band adaptations, and rubber dam isolation before clinical patient contact.

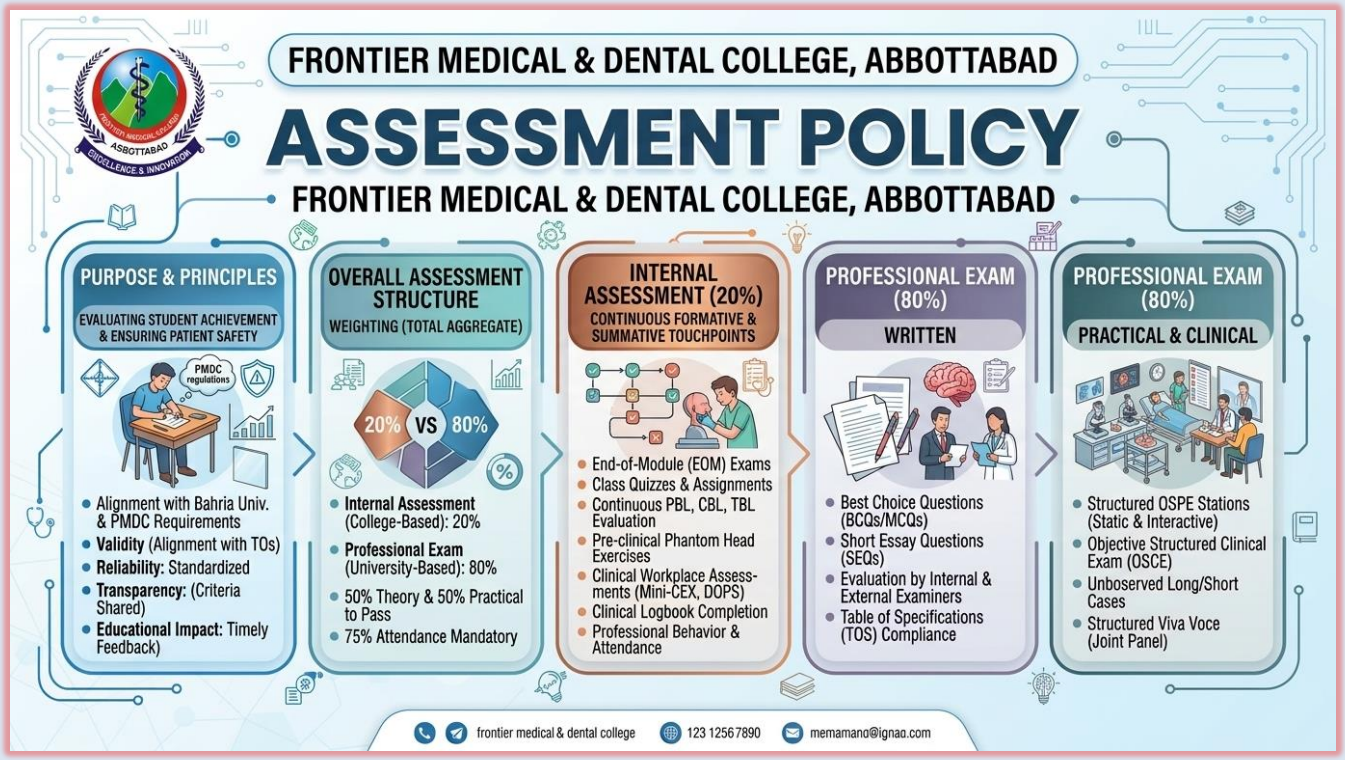
Dental Materials & Prosthodontic Laboratories: Practical experience in gypsum pouring, wax pattern carving, complete denture articulation, investing, dewaxing, acrylic processing, and casting procedures.

Chairside Clinical & Bedside Learning

Clinical instruction occurs directly in dental hospital outpatient departments, operating theatres, and hospital wards. Students observe and perform patient assessments, formulate treatment plans, execute restorative and surgical procedures, and attend hospital ward rounds under direct consultant supervision.

Technology-Enhanced & Digital Learning

The curriculum incorporates digital technologies into the learning environment, including digital intraoral radiography (RVG), cone beam computed tomography (CBCT) interpretation, intraoral digital scanners, CAD/CAM milling, and university learning management systems (LMS) for course materials and assessment tracking.



ASSESSMENT POLICY

Purpose and Principles

The assessment system evaluates student achievement against defined curricular outcomes, ensures patient safety, and promotes continuous professional development. It complies with Bahria University examination regulations and PMDC statutory requirements.

Validity: Assessment instruments align directly with curricular learning outcomes and blueprinted **Tables of Specifications (TOS).**

Reliability: Structured Objective Structured Practical Examinations (OSPE) and Objective Structured Clinical Examinations (OSCE) use standardized scoring rubrics.

Transparency: Assessment criteria, blueprints, and weighting schedules are shared with students in advance.

Educational Impact: Timely post-examination feedback identifies student strengths and learning gaps.

Assessment Structure

Student evaluation comprises two primary components:

Overall Assessment Weighting

1. **Internal Assessment (College-Based):** 20% of the total aggregate marks
2. **Professional Examination (University-Based):** 80% of the total aggregate marks A minimum of 50% marks in theory and 50% in practical/clinical components is required to pass each subject, with mandatory 75% class attendance.

Internal Assessment (20%)

Internal assessment marks are compiled continuously throughout each academic year from multiple formative and summative touchpoints:

1. End-of-Module (EOM) Examinations: Written papers (MCQs, SEQs) and practical/clinical OSPE/OSCE administered at the conclusion of each 12-week module.
2. Class Quizzes, Scheduled Tests, and Assignments.
3. Continuous Evaluation of PBL, CBL, and TBL sessions.
4. Pre-clinical phantom head exercise evaluations and laboratory performance.
5. Clinical Workplace-Based Assessments (Mini-CEX, DOPS, and Case-Based Discussions).
6. Clinical Logbook completion and procedural quota verification.
7. Professional behavior, attendance records, and adherence to clinical dress codes.

Professional Examination (80%)

Summative annual professional examinations are administered by Bahria University at the end of each academic year according to the approved Table of Specifications (TOS):

1. **Written Examinations:** Multiple Choice Questions (Best Choice Questions - BCQs) and Short Essay Questions (SEQs) evaluated by internal and external examiners.
2. **Practical & Clinical Examinations**: Structured OSPE (Objective Structured Practical Examination) with static and interactive stations, Objective Structured Clinical Examination (OSCE), and unobserved long/short cases.
3. Structured Viva Voce: Oral examinations conducted jointly by internal and university-appointed external examiners.

Assessment Quality Assurance

Assessment quality is maintained through systematic blueprinting, test item review committees, moderation of examination questions, post-test item analysis (calculating difficulty and discrimination indices), and benchmarking with national standards. Question banks are updated annually by DME.

Appeal Policy for Student Assessment Grievances

Frontier Dental College maintains a clear appeal policy for students seeking review of assessment results, with distinct pathways for internal assessments and university examinations:

Appeals Related to Internal Assessment

1. Grievance Authority: The FMDC Examination Cell and Student Grievance Committee serve as the primary institutional bodies for internal assessment concerns.

2. Filing Procedure: A written application detailing the specific grievance and supporting evidence must be submitted within seven (07) working days following the declaration of results.

3. Review Process: The Examination Cell reviews the assessment records, paper markings, and attendance logs. If necessary, the script is referred to a two-member subject review committee. The decision is communicated in writing and is final at the institutional level.

Appeals Related to Professional Examinations

1. Grievance Authority: The Controller of Examinations, Bahria University, Islamabad, is the sole authority for matters concerning university professional examinations.

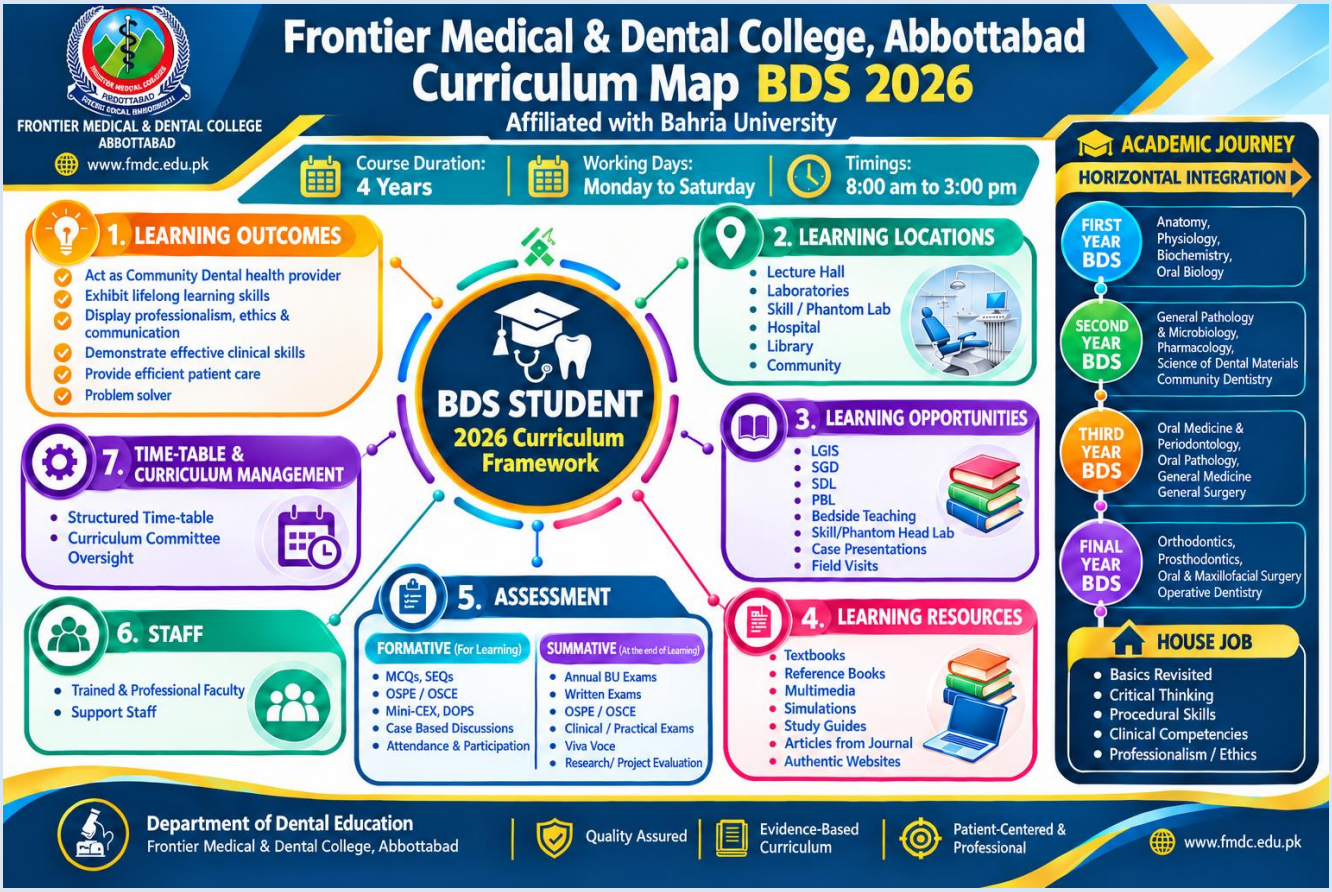
2. Filing Procedure: Applications for paper rechecking or verification must be submitted through the Dean/Principal's office within the timeframe established by Bahria University regulations.

3. Review Process: The University conducts rechecking in accordance with its statutory policies (verifying unmarked questions and recalculating totals). The College facilitates correspondence but does not influence the university's final ruling.

Assessment Compilation and Reporting

The FMDC Examination Cell maintains verified academic records for all students throughout their studies. Internal assessment scores are compiled, shared with students for verification, and submitted to Bahria University before the annual professional examinations. Bahria University officially declares the final examination results and overall academic standing.

Curriculum Map BDS



Prepared by:	Reviewed by:	Approved by:
_____	_____	_____
Department of Dental Education	Curriculum Committee Frontier Dental College	Prof. Dr. Abir Hussain Dean / Principal & Academic Council