

Revised Syllabus
For
D.E.N.T
Diploma in ENT Technician



**LAL BAHADUR SHASTRI HEALTH SCIENCES
AND TECHNICAL COUNCIL, INDIA**

लाल बहादुर शास्त्री आरोग्य विज्ञान एवं प्राविधिक परिषद, भारत

मुख्य कार्यालय : 4वीं मंजिल, प्राइम प्लाजा, इंदरा नगर, लखनऊ

प्रशासनिक कार्यालय : द्वितीय तल, सुनील कम्पलेक्स, वेस्टर्न कचेरी रोड, मेरठ

वेबसाइट – www.lbspstc.in संपर्क सूत्र –121-4349311

Exam : March and April
(To be implemented from 2026-27 session)

Syllabus Of “D.E.N.T” Diploma in ENT Technician

First Year (1st Year)

S.NO	Subject	Distribution Of Mark			
		TH	PR	Viva -Voce	Total
ENT-101	Basic Human Anatomy and Physiology	100	-	-	100
ENT -102	Anatomy and Physiology of Ear, Nose and Throat	100	-	-	100
ENT -103	Fundamentals of ENT Diseases	100	-	-	100
ENT -104	Infection Control and Sterilization	100	-	-	100
ENT -105	Basic Patient Care and First Aid (Theory & Practical)	-	100	-	100
	Total	-	-	-	500

Second Year (2nd Year)

S.NO	Subject	Distribution Of Mark			
		TH	PR	Viva -Voce	Total
ENT -201	Advanced ENT Diseases and Diagnostic Procedures	100	-	-	100
ENT -202	Audiology and Hearing Assessment Techniques	100	-	-	100
ENT -203	Ear Examination and Diagnostic Techniques	100	-	-	100
ENT -204	Nose and Sinus Diagnostic Techniques	100	-	-	100
ENT -205	Practical - II (Clinical ENT Procedures & Viva-Voce)	-	100	-	100
	Total	-	-	-	500

First Year (1st Year)

➤ DENT-101 – BASIC HUMAN ANATOMY AND PHYSIOLOGY

Unit 1 – Organization of Human Body & Cytology: Anatomical terminology, body planes, cavities; structure of human cell, organelles, cell division (Mitosis & Meiosis), membrane transport mechanisms, primary tissue classification (Epithelial, Connective, Muscular, Nervous).

Unit 2 – Skeletal & Muscular Systems: Structure and classification of bones of axial and appendicular skeleton; bones of the skull and facial skeleton (Frontal, Parietal, Temporal, Occipital, Sphenoid, Ethmoid, Maxilla, Mandible, Zygomatic, Nasal bones); types of joints; major head, neck, and masticatory muscles.

Unit 3 – Circulatory System & Blood: Anatomy of heart, major blood vessels (Carotid arterial system, Jugular venous system, Subclavian vessels); Systemic and pulmonary circulation; Composition and functions of blood (RBCs, WBCs, Platelets, Plasma), blood grouping (ABO, Rh), and hemostasis.

Unit 4 – Lymphatic System & Head-Neck Lymphatics: Structure and functions of lymphatic vessels, lymph nodes; Cervical lymph node levels (Levels I to VI), Waldeyer's lymphatic ring (Palatine tonsils, Lingual tonsils, Pharyngeal tonsil / Adenoids, Tubal tonsils); role in immune defense.

Unit 5 – Respiratory System: Anatomy of upper and lower respiratory tracts (Nose, Pharynx, Larynx, Trachea, Bronchial tree, Lungs, Alveoli); mechanics of pulmonary ventilation, alveolar gas exchange, lung volumes and capacities.

Unit 6 – Digestive System & Upper Aerodigestive Tract: Anatomy of Oral cavity, Tongue, Salivary glands (Parotid, Submandibular, Sublingual glands), Pharynx, Esophagus, Stomach, Intestines; mechanism of mastication, deglutition (Oral, Pharyngeal, Esophageal phases of swallowing), and salivary secretion.

Unit 7 – Excretory & Endocrine Systems: Anatomy of Kidneys and Nephron, mechanism of urine formation, fluid and electrolyte balance; Endocrine glands overview (Pituitary, Thyroid, Parathyroids, Adrenals) and their physiological hormones.

Unit 8 – Nervous System & Cranial Nerves Overview: Central Nervous System (Brain, Brainstem, Spinal cord), Peripheral and Autonomic Nervous System (Sympathetic and Parasympathetic); General overview of the 12 pairs of Cranial Nerves.

Unit 9 – Special Senses Overview: Structure and basic physiology of Special Sense Organs: Eye (Vision), Ear (Hearing & Equilibrium), Nose (Olfaction), Tongue (Gustation), and Skin (Cutaneous sensations).

Unit 10 – Basic Physiology & Systemic Homeostasis: Regulation of body temperature, arterial blood pressure, respiratory control, and homeostatic mechanisms maintaining physiological balance.

➤ **DENT-102 – ANATOMY AND PHYSIOLOGY OF EAR, NOSE AND THROAT**

Unit 1 – Anatomy & Physiology of External Ear: Pinna (Auricle) cartilaginous framework, landmarks (Helix, Antihelix, Tragus, Concha, Lobule); External Auditory Canal (EAC - Cartilaginous outer 1/3, Bony inner 2/3, Isthmus, Ceruminous and Sebaceous glands, epithelial migration); Tympanic Membrane (Pars tensa, Pars flaccida / Shrapnell's membrane, Umbo, Cone of light, Annulus tympanicus, layers).

Unit 2 – Anatomy & Physiology of Middle Ear: Tympanic cavity boundaries (Roof, Floor, Anterior, Posterior, Medial, Lateral walls); Epitympanum, Mesotympanum, Hypotympanum; Ossicular chain (Malleus, Incus, Stapes); Middle ear muscles (Tensor tympani, Stapedius) and acoustic stapedial reflex; Eustachian tube (Anatomy, cartilaginous/bony parts, Levator and Tensor veli palatini muscles, physiological functions of ventilation, protection, and clearance); Mastoid antrum and mastoid air cell system; Impedance matching mechanism (Areal ratio 17:1, Lever ratio 1.3:1).

Unit 3 – Anatomy & Physiology of Inner Ear: Bony and Membranous Labyrinth; Cochlea (Scala vestibuli, Scala media, Scala tympani, Helicotrema, Perilymph and Endolymph fluids); Organ of Corti, Inner and Outer Hair Cells, Tectorial membrane; Von Békésy traveling wave theory of hearing; Vestibular apparatus (Semicircular canals, Ampullae, Crista ampullaris for angular acceleration; Utricle and Sacculae, Maculae for linear acceleration).

Unit 4 – Central Auditory & Vestibular Pathways: Cranial Nerve VIII (Vestibulocochlear nerve), Cochlear nuclei, Superior Olivary Complex, Lateral Lemniscus, Inferior Colliculus, Medial Geniculate Body, Primary Auditory Cortex (Brodmann areas 41 & 42); Vestibular pathways and Vestibulo-Ocular Reflex (VOR).

Unit 5 – Anatomy & Physiology of the External Nose & Nasal Cavity: External nasal framework (Bony and Cartilaginous vault); Nasal septum (Perpendicular plate of ethmoid, Vomer, Septal cartilage, Columella); Lateral nasal wall: Superior, Middle, and Inferior Turbinates (Conchae) and Meatuses (Inferior meatus - Nasolacrimal duct; Middle meatus - Frontal, Maxillary, Anterior ethmoid sinuses / Osteomeatal complex; Superior meatus - Posterior ethmoids; Sphenothmoidal recess - Sphenoid sinus).

Unit 6 – Paranasal Sinuses (PNS) & Nasal Physiology: Gross anatomy, drainage pathways, and relations of Frontal, Maxillary, Ethmoid (Anterior and Posterior air cells), and Sphenoid sinuses; Functions of nose and PNS: Respiration, Air conditioning (Humidification and Temperature regulation), Filtration, Mucociliary clearance mechanism, Olfactory pathway (Olfactory nerve CN I, Olfactory bulb and cortex), Vocal resonance.

Unit 7 – Blood Supply & Nerve Innervation of Nose: Arterial supply: Internal carotid branches (Anterior and Posterior ethmoidal arteries) and External carotid branches (Sphenopalatine, Greater palatine, Superior labial arteries); Kiesselbach's plexus / Little's area

(site of anterior epistaxis) and Woodruff's plexus (posterior epistaxis); Sensory and autonomic innervation of nasal mucosa.

Unit 8 – Anatomy & Physiology of the Oral Cavity & Pharynx: Oral cavity boundaries, Hard and Soft palate, Tongue, Floor of mouth; Pharynx divisions: Nasopharynx (Adenoids, Eustachian tube orifice, Fossa of Rosenmüller), Oropharynx (Palatine tonsils, Faucial pillars, Posterior pharyngeal wall), Laryngopharynx / Hypopharynx (Pyriform fossae, Post-cricoid region, Posterior pharyngeal wall); Pharyngeal constrictor muscles; Deglutition reflex.

Unit 9 – Anatomy & Physiology of the Larynx & Vocal Tract: Laryngeal cartilaginous skeleton: Thyroid, Cricoid, Epiglottis, Arytenoid, Corniculate, Cuneiform cartilages; Laryngeal membranes, Vocal cords (True and False vocal cords, Glottis, Subglottis); Intrinsic laryngeal muscles (Cricothyroid, Posterior cricoarytenoid - sole abductor, Lateral cricoarytenoid, Thyroarytenoid / Vocalis, Interarytenoid); Extrinsic laryngeal muscles; Recurrent and Superior laryngeal nerves (Cranial Nerve X - Vagus); Mechanics of Phonation, Airway protection, and Cough reflex.

Unit 10 – Anatomy of Tracheobronchial Tree, Esophagus & Neck Spaces: Trachea (Cartilaginous rings, relations), Carina, Bronchial tree; Cervical Esophagus; Fascial layers of the neck (Deep cervical fascia), Retropharyngeal space, Parapharyngeal space, and Submandibular space (Ludwig's angina anatomical spread).

➤ **DENT-103 – FUNDAMENTALS OF ENT DISEASES**

Unit 1 – Diseases of External Ear: Congenital anomalies (Microtia, Anotia, Preauricular sinus/cyst); Impacted Cerumen (Ear wax), Foreign bodies in external canal, Otitis Externa (Localized furunculosis, Diffuse otitis externa, Otomycosis - fungal ear infection, Malignant / Necrotizing otitis externa in diabetics), Keratosis obturans, Hematoma auris.

Unit 2 – Diseases of Middle Ear (Infectious & Inflammatory): Eustachian Tube Dysfunction, Acute Otitis Media (AOM - Catarrhal, Exudative, Suppurative, Perforation stages), Otitis Media with Effusion (OME / Serous otitis media / Glue ear in children), Chronic Suppurative Otitis Media (CSOM - Tubotympanic / Mucosal type vs Atticoantral / Squamosal type with Cholesteatoma); Clinical signs and red flags.

Unit 3 – Complications of Middle Ear Infections: Intratemporal complications: Acute Mastoiditis, Mastoid abscess (Bezold, Citelli, Post-auricular abscess), Facial nerve paralysis, Labyrinthitis, Petrositis (Gradenigo's syndrome); Intracranial complications: Extradural abscess, Subdural abscess, Meningitis, Brain abscess (Temporal lobe, Cerebellar), Lateral sinus thrombosis.

Unit 4 – Diseases of Inner Ear & Hearing Loss: Otosclerosis (Stapes fixation, Carhart's notch); Presbycusis (Age-related hearing loss); Noise-Induced Hearing Loss (NIHL - 4 kHz acoustic notch); Meniere's Disease (Endolymphatic hydrops, episodic vertigo, fluctuating SNHL, tinnitus); Ototoxicity (Aminoglycosides, Cisplatin, Loop diuretics); Vestibular Schwannoma / Acoustic Neuroma.

Unit 5 – Diseases of the Nose & Septum: Deviated Nasal Septum (DNS - types, spurs, nasal obstruction), Septal Hematoma and Septal Abscess; Epistaxis (Causes: Local vs Systemic,

Anterior vs Posterior bleeding); Foreign bodies in nasal cavity, Rhinolith; Nasal vestibulitis, Furuncle nose and danger area of face (Cavernous sinus thrombosis risk).

Unit 6 – Rhinitis & Paranasal Sinus Diseases: Allergic Rhinitis (Etiology, clinical features, pale boggy turbinates), Non-Allergic Rhinitis (Vasomotor rhinitis, Atrophic rhinitis / Ozaena); Acute and Chronic Rhinosinusitis (Maxillary, Frontal, Ethmoid, Sphenoid sinusitis); Nasal Polyps (Antrochoanal polyp vs Ethmoidal polyposis); Complications of sinusitis (Orbital cellulitis, Subperiosteal abscess, Meningitis).

Unit 7 – Diseases of Oral Cavity & Salivary Glands: Aphthous ulcers, Oral Candidiasis (Thrush), Leukoplakia, Erythroplakia, Oral submucous fibrosis (OSMF); Sialadenitis (Acute suppurative parotitis), Sialolithiasis (Salivary duct stones - Wharton's duct), Ranula, Mumps (Epidemic parotitis).

Unit 8 – Diseases of Pharynx & Tonsils: Acute and Chronic Tonsillitis, Peritonsillar Abscess (Quinsy), Adenoid Hypertrophy in children (Mouth breathing, Adenoid facies, Sleep apnea); Acute and Chronic Pharyngitis, Retropharyngeal Abscess, Parapharyngeal Abscess, Ludwig's Angina.

Unit 9 – Diseases of Larynx & Voice Disorders: Acute Laryngitis, Acute Laryngotracheobronchitis (Croup), Acute Epiglottitis (Emergency airway danger in children); Chronic Laryngitis; Benign vocal cord lesions (Vocal nodules / Singer's nodes, Vocal cord polyps, Reinke's edema, Contact ulcers, Vocal cord papillomatosis); Vocal cord paralysis (Unilateral vs Bilateral abductor paralysis).

Unit 10 – Airway Foreign Bodies & ENT Malignancies Overview: Foreign body ingestion and inhalation (Bronchial foreign bodies, Esophageal foreign bodies - Coins, Fish bones, Dentures, Meat bolus); Overview of common ENT malignancies: Carcinoma of Larynx, Nasopharyngeal Carcinoma, Carcinoma of Tongue, and Maxillary Sinus Carcinoma.

➤ **DENT-104 – INFECTION CONTROL AND STERILIZATION**

Unit 1 – Principles of Infection Control in ENT Practice: Microbiology of ENT infections (Common bacterial, viral, fungal pathogens); Chain of infection (Infectious agent, Reservoir, Portal of exit, Mode of transmission, Portal of entry, Susceptible host); Standard / Universal precautions in ENT OPD and Minor OT.

Unit 2 – Hand Hygiene & Personal Protective Equipment (PPE): WHO 6-step Hand Hygiene technique (Alcohol rub vs Soap and water wash), Hand hygiene moments; Correct selection, donning, and doffing of PPE: Surgical masks, N95 respirators, Eye protection (Goggles / Face shields for aerosol-generating ENT procedures), Gloves, Gowns, and Aprons.

Unit 3 – Physical Methods of Sterilization: Steam Sterilization / Autoclaving (Principles, temperature, pressure, holding time - Gravity displacement 121°C for 15-30 min, Pre-vacuum 134°C for 3-5 min); Dry Heat Sterilization (Hot Air Oven 160°C for 2 hours, glassware and metal instruments); Quality control indicators (Chemical indicator tapes, Bowie-Dick test, Biological indicators - *Geobacillus stearothermophilus*).

Unit 4 – Chemical Sterilization & High-Level Disinfection (HLD): Chemical sterilants: 2% Glutaraldehyde (Cidex - soaking time for HLD vs Sterilization, activation, shelf-life), Ortho-phthalaldehyde (OPA 0.55%), Peracetic acid, Hydrogen Peroxide; Low-temperature Gas Plasma sterilization (Sterrad system) for rigid and flexible endoscopes; Ethylene Oxide (ETO) gas sterilization.

Unit 5 – Processing & Care of ENT Endoscopes: Step-by-step cleaning, leak testing, manual enzymatic cleaning, high-level disinfection, rinsing with sterile water, drying, and storage of Rigid Nasal Endoscopes, 70°/90° Laryngoscopes, and Flexible Fiberoptic Nasopharyngolaryngoscopes (preventing lens and fiber breakage).

Unit 6 – Disinfection & Care of ENT Clinic Instruments: Decontamination, ultrasonic cleaning, lubrication, packaging, and sterilization of metal instruments: Otic speculums, Jobson-Horne probes, Ear syringes, Crocodile forceps, Thudichum nasal speculums, Tilley forceps, Tongue depressors, Laryngeal mirrors, Suction cannulas, and Micro-instruments.

Unit 7 – Cleaning & Maintenance of ENT Suction Apparatus & Workstations: Decontamination of ENT suction tubing, suction canisters, suction filters; Cleaning and disinfection of ENT treatment units/chairs, microscope optical lenses, light sources, fiberoptic cables, and headlamps.

Unit 8 – Decontamination & Care of Audiometric Equipment: Cleaning, disinfection, and maintenance of otoscope speculums, tympanometry probe tips, audiometer headphone cushions, insert earphone foam tips, and bone vibrators; Prevention of cross-infection in audiology booths.

Unit 9 – Biomedical Waste Management (BMW) in ENT Settings: Segregation of clinical waste at source as per BMW Rules: Yellow bin (Anatomical waste, soiled cotton swabs, suction fluid, gauze with blood/pus), Red bin (Contaminated plastics, suction tubing, syringes without needle), Blue bin (Glass vials, ampoules), White translucent puncture-proof box (Needles, scalpel blades, sharp wires); Safe storage and transport.

Unit 10 – Clinic Hygiene, Spill Management & Needle-Stick Injury Protocol: Daily surface disinfection of ENT examination tables, spittoons, and treatment units; Management of blood and body fluid spills (1% Sodium Hypochlorite); Protocol for accidental needle-stick injury or conjunctival splash (First aid, reporting, Post-Exposure Prophylaxis / PEP for HBV, HCV, HIV).

➤ **DENT-105 – BASIC PATIENT CARE AND FIRST AID (THEORY & PRACTICAL)**

Unit 1 – Principles of Basic Patient Care & Communication: Role and responsibilities of an ENT Technician; Patient reception, registration, maintaining patient privacy, dignity, and informed consent; Communication skills with anxious patients, children, and elderly individuals with hearing impairment.

Unit 2 – Measurement & Recording of Vital Signs: Techniques, normal ranges, and clinical significance of: Body Temperature (Digital/Oral/Tympanic thermometers), Radial

Pulse rate, Respiratory rate, Blood Pressure (Sphygmomanometer & Stethoscope), and Pulse Oximetry (SpO2 monitoring).

Unit 3 – Patient Positioning for ENT Procedures: Positioning techniques for ENT examination and minor procedures: Standard ENT sitting position (upright with head support), Rose position (neck extended for tonsillectomy/tracheostomy), Supine position, Lateral position for ear syringing, and positioning for flexible endoscopy.

Unit 4 – First Aid in Epistaxis (Nosebleed Emergency): Immediate first aid: Trotter's method (Sitting upright, leaning forward, pinching soft part of nose for 10-15 minutes, breathing through mouth, cold pack on forehead); Ice packs; Assisting in Anterior Nasal Packing (Ribbon gauze with BIPP/liquid paraffin, Merocel sponges) and Rapid-Rhino balloon catheters; Assisting in Posterior Nasal Packing (Foley catheter balloon technique).

Unit 5 – First Aid & Removal of ENT Foreign Bodies: Foreign body in Ear (Insects: killing with mineral oil/saline before removal, vegetable seeds: avoiding water syringing, beads); Foreign body in Nose (Do's and don'ts, Parent's kiss technique, assisting instrumentation); Foreign body in Throat/Airway (Choking: Heimlich maneuver / Abdominal thrusts, Back blows in infants).

Unit 6 – Cardiopulmonary Resuscitation (CPR) & Basic Life Support (BLS): Step-by-step adult, child, and infant Basic Life Support (C-A-B protocol: Chest compressions, Airway opening, Rescue breaths); Automated External Defibrillator (AED) operation; Recovery position in unconscious breathing patients.

Unit 7 – Emergency Airway Management & Tracheostomy Care: Recognition of acute upper airway obstruction, Stridor; Assisting in emergency Cricothyroidotomy and Tracheostomy; Routine Tracheostomy tube care (Suctioning technique, Inner cannula cleaning, Dressing, Humidification, Cuff pressure monitoring, emergency replacement of displaced tubes).

Unit 8 – Management of Syncope, Vertigo & Anaphylaxis in Clinic: First aid in Vasovagal Syncope / Fainting during minor ENT procedures (Trendelenburg position, airway check); Management of acute Vertigo / Dizziness attacks; Recognition and immediate emergency management of Local Anesthetic Toxicity / Anaphylactic shock (Adrenaline, Oxygen, IV line).

Unit 9 – Wound Care, Minor Bandaging & Post-Operative Dressings: Aseptic wound dressing, Ear mastoid pressure dressing (Mastoid bandage), Nasal bolster dressing, Post-tonsillectomy bleeding monitoring, Suture removal technique.

Unit 10 – Emergency First Aid Kit & Practical Clinical Assessment: Composition and maintenance of standard ENT Emergency Crash Cart; Simulation of CPR, Epistaxis packing, Tracheostomy suctioning, and practical viva-voce.

Second Year (2nd Year)

➤ DENT-201 – ADVANCED ENT DISEASES AND DIAGNOSTIC PROCEDURES

Unit 1 – Advanced Otological Diseases & Surgical Interventions: Pathology, clinical features, and surgical overview of: Cholesteatoma, Otosclerosis (Stapedotomy / Stapedectomy), Facial Nerve Decompression, Tympanoplasty (Types I to V), Mastoidectomy (Cortical, Modified Radical, Radical), Bone Anchored Hearing Implants (BAHA), and Cochlear Implants (CI).

Unit 2 – Advanced Rhinology & Skull Base Pathologies: Pathophysiology and management of Chronic Rhinosinusitis with Nasal Polyps (CRSwNP), Allergic Fungal Rhinosinusitis (AFRS), Fungal Sinusitis (Mucormycosis in immunocompromised/diabetic patients); Inverted Papilloma, Juvenile Nasopharyngeal Angiofibroma (JNA); Cerebrospinal Fluid (CSF) Rhinorrhoea (diagnosis: Beta-2 transferrin, endoscopic repair).

Unit 3 – Functional Endoscopic Sinus Surgery (FESS) Setup: Principles of FESS (Messerklinger and Wigand techniques); FESS instrumentation: 0°, 30°, 45°, 70° rigid telescopes, Microdebrider system, Sinus curettes, Sickie knife, Blakesley forceps, Antrum punch forceps; Pre-operative CT Paranasal Sinus (PNS) correlation; Intra-operative assisting and post-op nasal debridement.

Unit 4 – Advanced Laryngology, Voice & Airway Disorders: Laryngomalacia (Omega-shaped epiglottis in stridor infants), Subglottic Stenosis, Vocal fold paralysis, Spasmodic Dysphonia, Laryngeal Carcinoma (TNM staging, Total/Partial Laryngectomy, Voice rehabilitation with Tracheoesophageal Puncture / TEP / Provox prosthesis).

Unit 5 – Microlaryngeal Surgery (MLS) & Endoscopic Laryngeal Procedures: Instrumentation and setup for MLS: Kleinsasser laryngoscope, Boston suspension gantry, Operating microscope, Micro-scissors, Micro-forceps, CO₂ / Diode Lasers; Assisting during vocal cord polyp/nodule excision and biopsy.

Unit 6 – Sleep-Disordered Breathing & Obstructive Sleep Apnea (OSA): Pathophysiology of OSA in children (Adenotonsillar hypertrophy) and adults; Clinical features (Loud snoring, daytime somnolence, apnea episodes); Diagnostic evaluation: Polysomnography (Sleep Study - Apnea-Hypopnea Index / AHI), Drug-Induced Sleep Endoscopy (DISE); Treatment modalities: CPAP / BiPAP therapy, Uvulopalatopharyngoplasty (UPPP).

Unit 7 – Diseases of the Salivary Glands & Sialoendoscopy: Salivary neoplasms: Pleomorphic Adenoma, Warthin's tumor, Adenoid Cystic Carcinoma; Diagnostic Sialoendoscopy for salivary duct stones and strictures; Superficial and Total Parotidectomy (Facial nerve monitoring).

Unit 8 – Head and Neck Masses & Diagnostic Biopsy Procedures: Differential diagnosis of neck swellings (Thyroid nodules, Thyroglossal cyst, Branchial cyst, Lymphadenopathy,

Carotid body tumor); Assisting in Fine Needle Aspiration Cytology (FNAC), Core needle biopsy, and Excisional lymph node biopsy.

Unit 9 – Esophagoscopy & Bronchoscopy in ENT: Rigid vs Flexible Esophagoscopy for foreign body removal, diagnostic biopsy, and dilation of strictures; Rigid Bronchoscopy instrumentation and assisting in foreign body airway retrieval in pediatric emergencies.

Unit 10 – Radiological Imaging Correlation in ENT: Radiological interpretation of: X-ray Mastoids (Schuller's and Towne's views), X-ray Paranasal Sinuses (Waters view), X-ray Soft Tissue Neck (Lateral view for adenoids, epiglottitis, prevertebral widening); High-Resolution CT (HRCT) Temporal Bone; CT Paranasal Sinuses (Coronal & Axial views); MRI Brain and Internal Auditory Meatus (IAM).

➤ **DENT-202 – AUDIOLOGY AND HEARING ASSESSMENT TECHNIQUES**

Unit 1 – Diagnostic Audiometry Instrumentation & Acoustic Booths: Diagnostic Pure Tone Audiometers (Dual channel, standards), Acoustic environment: Sound-treated rooms (Permissible ambient noise levels as per ANSI/ISO standards), Calibration of transducers (Headphones TDH-39/49, Insert earphones ER-3A, Bone vibrator B-71).

Unit 2 – Pure Tone Audiometry (PTA) Protocol: Patient instruction, transducer placement, Modified Hughson-Westlake threshold search procedure (5 dB up - 10 dB down); Air Conduction (125 Hz to 8000 Hz) and Bone Conduction (250 Hz to 4000 Hz) testing; Audiogram configuration (Flat, Sloping, Rising, Notch, Cookie-bite) and Pure Tone Average (PTA) calculation.

Unit 3 – Clinical Masking in Audiometry: Concepts of cross-hearing, Interaural Attenuation (IA: 40 dB for headphones, 60-70 dB for insert earphones, 0 dB for bone vibrator), Shadow curve recognition; Narrow-Band Noise (NBN), Plateau method (Hood's technique), Undermasking, Overmasking, and Masking Dilemma.

Unit 4 – Speech Audiometry Techniques: Speech Reception Threshold (SRT) using spondee words, Speech Detection Threshold (SDT / SAT), Word Recognition Score (WRS / Speech Discrimination Score) using Phonetically Balanced (PB) word lists, Most Comfortable Loudness (MCL), Uncomfortable Loudness Level (UCL), Dynamic Range; Clinical correlation with PTA.

Unit 5 – Immittance Audiometry / Tympanometry: Principles of acoustic immittance (Admittance, Impedance, Compliance); Probe assembly, 226 Hz probe tone; Tympanogram parameters (Ear canal volume / ECV, Peak compliance, Tympanometric peak pressure / TPP, Gradient); Jerger classification of tympanograms: Type A (normal), Type As (otosclerosis/malleus fixation), Type Ad (ossicular discontinuity/thin eardrum), Type B (otitis media with effusion/perforation), Type C (Eustachian tube dysfunction).

Unit 6 – Acoustic Stapedial Reflex Testing & Reflex Decay: Acoustic reflex arc (Ipsilateral and Contralateral pathways); Acoustic reflex threshold (ART: 500, 1000, 2000, 4000 Hz); Clinical interpretation in Conductive loss, Cochlear pathology (Recruitment),

Retrocochlear pathology (Absent reflexes), and Facial nerve lesions; Acoustic Reflex Decay test for acoustic neuroma screening.

Unit 7 – Special & High-Frequency Audiometric Tests: Short Increment Sensitivity Index (SISI test for cochlear lesion), Tone Decay Test (TDT for retrocochlear fatigue), Alternate Binaural Loudness Balance (ABLB test for recruitment), Extended High-Frequency (EHF) audiometry (9 kHz to 16 kHz) for early ototoxicity and acoustic trauma detection.

Unit 8 – Pediatric Hearing Assessment Techniques: Behavioral Observation Audiometry (BOA for infants 0-6 months), Visual Reinforcement Audiometry (VRA for 6-24 months), Conditioned Play Audiometry (CPA with blocks/pegs for 2-5 years); Universal Newborn Hearing Screening (UNHS) protocols.

Unit 9 – Objective Electrophysiological Hearing Tests: Otoacoustic Emissions (OAE: Transient Evoked / TEOAE and Distortion Product / DPOAE - testing outer hair cell function); Auditory Brainstem Response (ABR / BERA - Waves I to V, Interpeak latencies I-III, III-V, I-V, Threshold ABR vs Neurological ABR); Auditory Steady-State Response (ASSR).

Unit 10 – Hearing Aids & Assistive Listening Devices (ALD): Types of hearing aids (Pocket, BTE, RIC, ITE, ITC, CIC, Bone Conduction Hearing Aids); Digital hearing aid programming basics, Ear mold impressions, Trouble-shooting hearing aid faults, ALDs (FM systems, Induction loops), and Overview of Cochlear Implant rehabilitation.

➤ **DENT-203 – EAR EXAMINATION AND DIAGNOSTIC TECHNIQUES**

Unit 1 – Clinical Examination of the Ear & Pinna: Systematic inspection and palpation of Pinna, Post-auricular groove, Mastoid tip, Pre-auricular area, Tragal tenderness test (furunculosis sign); Inspection of external auditory meatus for discharge, edema, exostosis, and stenosis.

Unit 2 – Otoscopic Examination & Video-Otoscopy: Technique of Otoscopy: Handheld otoscope components, speculum selection, canal straightening maneuver in adults and children; Identifying landmarks of Tympanic Membrane: Pars tensa, Pars flaccida, Handle of Malleus, Lateral process, Umbo, Cone of Light, Anterior/Posterior malleolar folds; Video-Otoscopy systems, image capture, patient documentation.

Unit 3 – Diagnostic Evaluation of Tympanic Membrane Pathologies: Otoscopic identification of: Retracted tympanic membrane (prominent lateral process, foreshortened malleus handle), OME (fluid level, air bubbles, amber/dull drum), Acute Otitis Media (hyperemic, bulging drum / red hot potato sign), Central perforation (tubotympanic CSOM), Marginal / Attic perforation with Cholesteatoma flakes, Tympanosclerosis (chalky white patches), Hemotympanum, Glomus tumor (pulsatile red mass / rising sun sign).

Unit 4 – Pneumatic Otoscopy & Siegel's Speculum: Principles and technique of Pneumatic Otoscopy (Siegel's speculum with rubber bulb); Assessing tympanic membrane mobility (reduced mobility in OME/glue ear, hypermobility in ossicular disruption); Fistula Test

(inducing positive pressure in canal to elicit nystagmus and vertigo in labyrinthine fistula / cholesteatoma).

Unit 5 – Tuning Fork Tests (Acoustic Evaluation): Selection of frequencies (256 Hz, 512 Hz, 1024 Hz - rationale for 512 Hz); Performing and clinical interpretation of: Rinne Test (Positive, Negative, False Negative in severe unilateral SNHL), Weber Test (Lateralization to diseased ear in CHL, healthy ear in SNHL), Schwabach Test, Absolute Bone Conduction (ABC Test), Bing Test, Gelle's Test (stapes fixation).

Unit 6 – Examination Under Microscope (EUM) of Ear: Operating microscope setup (Focal length 200 mm / 250 mm, magnification changer, light source, binocular eyepiece adjustment); Patient positioning; Micro-suction clearance of ear discharge, wax, and debris; Aseptic removal of foreign bodies under microscope.

Unit 7 – Ear Syringing & Wax Clearance Techniques: Indications and contraindications of ear syringing (Absolute contraindication: history of tympanic membrane perforation); Water temperature check (Body temperature 37°C to prevent caloric vestibular stimulation); Direction of water jet (Postero-superior canal wall); Complications (TM rupture, canal trauma, vertigo); Manual cerumen removal using Jobson-Horne probe, wax hook, and suction cannula.

Unit 8 – Vestibular & Balance Function Testing: Clinical evaluation of vertigo: Spontaneous Nystagmus testing (Frenzel goggles); Head Shake Test, Head Impulse Test (Halmagyi vHIT); Dix-Hallpike Maneuver for Benign Paroxysmal Positional Vertigo (BPPV - posterior semicircular canal canalithiasis) and Epley Particle Repositioning Maneuver; Vestibulospinal tests (Romberg test, Sharpened Romberg, Unterberger stepping test).

Unit 9 – Caloric Testing & Videonystagmography (VNG) Basics: Principles of Bithermal Caloric Test (COWS rule: Cold Opposite, Warm Same); Water and Air Caloric irrigators; Videonystagmography (VNG / ENG - Goggles with infrared cameras, Saccade test, Smooth pursuit, Optokinetic test, Positional testing, and Caloric response analysis for canal paresis).

Unit 10 – Eustachian Tube Function (ETF) Diagnostic Tests: Valsalva Maneuver, Toynbee Maneuver, Politzerization technique; Tympanometric ETF test for intact tympanic membrane (William's test - 3 pressure changes) and perforated tympanic membrane (air pressure equalization test).

➤ **DENT-204 – NOSE AND SINUS DIAGNOSTIC TECHNIQUES**

Unit 1 – Clinical Examination of the External Nose & Facial Skeleton: Inspection and palpation of external nasal contour, nasal bridge (Saddle nose, Hump nose, Crooked nose), Cottle's test for nasal valve collapse, Palpation of facial bones and Paranasal Sinus tenderness points (Frontal sinus floor, Maxillary canine fossa, Ethmoidal medial canthus).

Unit 2 – Anterior Rhinoscopy Technique: Instrumentation: Thudichum Nasal Speculum (holding technique in left hand), Headlamp / Bull's eye lamp with concave head mirror; Technique of anterior rhinoscopy: Inspection of Nasal Vestibule, Septum (Spurs, Deviations,

Perforations, Little's area vascularity), Inferior Turbinate (size, color, mucosal hypertrophy), Middle Turbinate, and Middle Meatus (discharge, polyps, crusts).

Unit 3 – Posterior Rhinoscopy Technique: Instrumentation: Small heated/anti-fogged Post-Rhinoscopic Mirror, Tongue Depressor (Lack's tongue depressor); Technique of posterior rhinoscopy: Inspection of Posterior Choanae, Posterior border of Septum, Posterior ends of Turbinates, Eustachian Tube Pharyngeal Orifices, Adenoid mass in roof of Nasopharynx, and Fossa of Rosenmüller.

Unit 4 – Diagnostic Rigid Nasal Endoscopy (Diagnostic FESS): Components of Rigid Endoscopy System: Hopkins rod-lens rigid endoscopes (0°, 30°, 45°, 70° with 4 mm and 2.7 mm diameters), Cold light source (Xenon/LED), Fiberoptic cable, Medical grade HD/4K camera system and monitor; Topical nasal decongestion and local anesthesia technique (4% Xylocaine with 1:100,000 Adrenaline / Otrivin packs).

Unit 5 – Three-Pass Technique of Diagnostic Nasal Endoscopy: Standardized Three-Pass Endoscopic Examination: First Pass (Along nasal floor: Inferior meatus, Nasal floor, Nasopharynx, Eustachian tube cushion, Adenoids); Second Pass (Between middle turbinate and septum: Sphenoethmoidal recess, Olfactory cleft, Sphenoid sinus ostium); Third Pass (Into Middle Meatus: Uncinate process, Semilunar hiatus, Bulla ethmoidalis, Maxillary sinus ostium, Frontal recess).

Unit 6 – Flexible Fiberoptic Nasopharyngolaryngoscopy: Indications, handling, and technique of Flexible Endoscopy; Topical spray anesthesia; Dynamic evaluation of Velopharyngeal closure, Adenoids, Base of Tongue, Vallecula, Epiglottis, Pyriform fossae, Vocal cord mobility during phonation ('Eee') and inspiration; Evaluation of Stridor and Laryngeal lesions.

Unit 7 – Diagnostic Evaluation of Epistaxis & Rhinorrhea: Locating bleeding source using suction-endoscopy (Anterior ethmoidal artery, Sphenopalatine artery branches); Diagnostic confirmation of CSF Rhinorrhea: Handkerchief test, Reservoir sign, Target/Halo sign, Glucose test, Beta-2 Transferrin / Beta-Trace Protein assay; Fluorescein endoscopic localization.

Unit 8 – Olfactory & Nasal Patency Testing: Olfactory function assessment: Qualitative testing using standard non-trigeminal odorants (Coffee, Peppermint, Rose, Vanilla), Quantitative tests (UPSIT - University of Pennsylvania Smell Identification Test / Sniffin' Sticks); Nasal patency testing: Cold spatula / Glatzel mirror condensation test, Peak Nasal Inspiratory Flow (PNIF).

Unit 9 – Acoustic Rhinometry & Rhinomanometry Basics: Acoustic Rhinometry: Sound reflection principle, Measurement of cross-sectional areas (Minimal Cross-sectional Area / MCA 1 and MCA 2) and nasal cavity volume; Rhinomanometry: Measurement of nasal airflow and transnasal pressure gradient, calculating total nasal airway resistance (NAR) before and after decongestants.

Unit 10 – Sinus Transillumination & Diagnostic Antral Puncture: Sinus Transillumination test (Maxillary and Frontal sinuses using dark room transilluminator lamp); Assisting in Diagnostic Antral Lavage / Proof Puncture (Lichtwitz trocar and cannula via inferior meatus, saline irrigation for pus/fluid examination).

➤ **DENT-205 – PRACTICAL - II (CLINICAL ENT PROCEDURES & VIVA-VOCE)**

Unit 1 – Pure Tone Audiometry & Clinical Masking Hands-On: Conducting air conduction and bone conduction pure tone audiometry on adult and pediatric clinical patients, applying Plateau masking technique, plotting audiograms, calculating PTA and air-bone gaps.

Unit 2 – Tympanometry & Acoustic Reflex Testing Hands-On: Obtaining hermetic probe seal, recording 226 Hz tympanograms, categorizing Jerger curves (Type A, As, Ad, B, C), and testing ipsilateral/contralateral acoustic stapedial reflexes.

Unit 3 – Otoacoustic Emissions (OAE) & Hearing Screening Practice: Operating portable TEOAE and DPOAE screening devices on neonates and infants, interpreting Pass/Refer screening results.

Unit 4 – Video-Otoscopy & Ear Examination Under Microscope (EUM): Performing video-otoscopic documentation, operating ENT surgical microscope, assisting in micro-suction clearance of ear canal and removal of foreign bodies.

Unit 5 – Tuning Fork Tests & Vestibular Screening Execution: Executing 512 Hz Rinne, Weber, Schwabach tests; performing Dix-Hallpike test for BPPV and demonstration of Epley repositioning maneuver.

Unit 6 – Rigid Nasal Endoscopy Setup & Assisting: Assembling 0° and 30° rigid nasal endoscopes, white balancing HD camera, preparing topical decongestant packs, and assisting ENT surgeon during diagnostic nasal endoscopy.

Unit 7 – Flexible Nasopharyngolaryngoscopy Handling & Decontamination: Setting up flexible fiberoptic endoscope, topical spray anesthesia preparation, assisting examination, performing leak test and high-level disinfection (Cidex/OPA) post-procedure.

Unit 8 – Ear Syringing, Suctioning & Wax Removal: Demonstration of ear syringing with warm saline at 37°C, handling suction cannulas (Baron/Frazier suction tips), and safe cerumen removal.

Unit 9 – Epistaxis Emergency Packing Assisting: Assembling anterior nasal packing materials (Merocel, Ribbon gauze with BIPP, Rapid-Rhino), preparing posterior Foley catheter pack, and demonstrating Trotter's first aid method.

Unit 10 – Clinical Logbook, ENT Case Studies & Grand Viva-Voce: Evaluation of completed clinical training logbook (minimum 50 audiometry tests, 25 endoscopy assisting records, 25 ear examinations), instruments identification, and grand viva-voce.

