# SYLLABUS OF PART – I

## SUBJECT: ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS:

### Applied Anatomy:

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

### Physiology:

- Endocrinology and its disorders
  Growth hormone, thyroid hormone, parathyroid hormone, ACTH, pituitary gland hormones, thyroid gland hormones, parathyroid gland hormones.
- Calcium and its metabolism
- Nutrition-metabolism and their disorders: proteins, carbohydrates, fats, vitamins and minerals.
- Muscle physiology
- Craniofacial Biology
- Bleeding disorders in orthodontics: Hemophilia.
- Saliva
- Tooth structure and PDL
- Sleep physiology and sleep disorder
- Pain Pathways

- Deglutition and Stages
- Swallowing Patterns

**Dental Materials:**

- Gypsum products: dental plaster, dental stone and their properties, setting reaction etc.
- Impression materials: impression materials in general and particularly of alginate impression material.
- Acrylics: chemistry, composition physical properties
- Composites: composition types, properties setting reaction
- Banding and bonding cements: Zn (P04)2, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass lonomer cements
- Wrought metal alloys: deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
- Orthodontic arch wires: stainless steel gold, wrought cobalt chromium nickel alloys, alpha &beta titanium alloys and new wires in orthodontics
- Elastics: Latex and non-latex elastics
- Applied physics, Bioengineering and metallurgy.
- Specification and tests methods used for materials used in Orthodontics
- Survey of all contemporary literature and recent advances in above – mentioned materials.
- Bite registration materials
- Thermoplastic resins
- Magnets
- Soldering and Welding

**Genetics:**

- Cell structure, DNA, RNA, protein synthesis, cell division
- Chromosomal abnormalities
- Principles of orofacial genetics
- Genetics in malocclusion
- Molecular basis of genetics
- Studies related to malocclusion
- Recent advances in genetics related to malocclusion
- Genetic counseling
- Bioethics and relationship to Orthodontic management of patients.
- Genetics and syndromes

**Applied Pharmacology:**

- NSAID's, Prostaglandin, Biphosphanate, Anti-Sialogogues
- Allergies
- Drugs for accelerated orthodontics

**Research Methodology and bio statistics:**

- Statistical principles
- Data Collection
- Method of presentation
- Method of Summarizing
- Methods of analysis - different tests/errors
- Sampling and Sampling technique
- Experimental models, design and interpretation
- Experimental design
- Animal experimental protocol
- Principles in the development, execution and interpretation of methodologies in Orthodontics
- Critical Scientific appraisal of literature

**Pathology:**

- Pain
- Inflammation
- Necrosis.
- Osteoporosis
- Wound Healing
- Fracture Healing
- Infection Control in Orthodontics / Sterilization
- Role of local and general factors in the etiology of malocclusion
- Developmental defects of the orofacial structures.

**Physical Anthropology:**

- Evolutionary development of dentition
- Evolutionary development of jaws