SYLLABUS FOR THE DENTAL MECHANICS COURSE PRIMARY (1ST YEAR)

APPLIED PHYSICS:

Specific gravity, density, properties of matter including cohesion, capillarity, surface tension, viscosity, elasticity, diffusion and osmosis.

Heat: Temperature and its measurements, Thermometers and Pyrometers. General account of expansion by heat of solids, liquids and gases. Thermostats, Pressure gas and hydraulic. Boyle's and Charles laws. unit of heat, thermal capacity and Specific Heat, Change of State; Latent Heat; Melting Point. Properties of vapours, conduction, convection and radiation.

Principles of electro - technology applied to dental work room. Small motors, constructional features and characteristics, electric furnaces, heaters, thermostats, pyrometers, spot welders, electroplating, electro-forming, and anodizing, wiring regulations relating to low voltage supplies.

Exercises/Demonstrations:

- Balance - weighing correct to a milligram
- Determination of specific gravity by the principle of Archimedes (solids and liquids)
- Determination of surface tension of a liquid by capillary rise
- Determination of linear expansion of solids (level method)
- Determination of specific heats of solids and liquids by method of mixture
- Small motors - constructional features and characteristics (demonstration only)
- Determination of electrochemical equivalent of copper

APPLIED MEHANICS:

Forces, parallelogram and triangle of forces. Moments, couples, centre of gravity, principles of lever and cantilever work, energy, power, friction, inclined plane, screw stress, strain, sheeting strain, torsion, bending movements, strength and stiffness of materials.

Exercises/Demonstrations:

- Verification of the parallelogram and triangle laws of forces
- Inclined plane determination of mechanical advantage

- Determination of young's modulus by bending of beams

APPLIED CHEMISTRY:

Distinction between physical and chemical change; elements, mixtures, and compounds; composition of the atmosphere; oxygen oxides, burning and rusting; water solvent properties and crystallization; action of water on metals; composition of water hydrogen; laws of chemical combination; meaning of chemical symbols valency; simple chemical equations; acids, bases and salts.

Electrolysis, the ionic theory of solution. The electropotential series, electroplating, general characteristics of the metal including elementary study of the common metal and there alloys with special reference and to those used in the dental work room.

Alcohols, ethers, aldehydes and ketones fatty acids and there more important derivatives, amines. Simple treatment of carbohydrates, fats and proteins, benzens and its homologues. General characteristics of aromatic substances. synthetic resins and plastics used in dentistry.

Exercises /demonstrations:

- Test for acid and alkalis radicals
- Acid base titration -neutralization of acids with alkalis. titration of N/10 NaOH with N/10 H_2SO_4 phenophthalin or methyl red as indicator
- Total nitrogen determination in organic nitrogenous material .digestion and distillation
- Total nitrogen determination in inorganic (ammoniacal)solutions (or salts) by direct distillation with Mg
- Determination of phosphorus in inorganic material by precipitation
- Electrolytic deposition (electrolysis and electroplating of metal)

  (c) deposition of copper by electrolysis of copper sulphate solution .

  (d) calculation of E.C.E.

APPLIED ORAL ANATOMY:

- Elementry anatomy and structure of denture /bearing area.

- Human dentition and occlusion
- Functions of teeth and morphology of crowns of teeth
- Muscles of mastication and mastication and facial expression
- Mastication deglutition and phonation
- Movements of tempera mandibular joint

Exercise /demonstration:

- Tooth carving in wax and plaster.(crown and root ,scale and enlarged models)

DENTAL MECHANICS (PRIMARY):

- Infection control measures for impression and models
- Impression preservation and boxing -in
- Cast: preparation, trimming, including orthodontics casts
- Cast duplication -various methods
- Construction of special trays - spacers
- Bite blocks - base plates and wax rims
- Articulators : classification, daily uses, and care of articulators
- Adjustments, mounting and casts
- Articulation, occlusal plane, protrusive balance, working bite, balancing bite, curve of space, compensating curve, lateral curve
- Principles of selection of teeth
- Setting of teeth and wax finishing
- Flasking, dewaxing, packing, curing and deflasking
- Finishing and polishing of dentures
- Additions, repairs, relining and rebasing of dentures
- Immediate denture construction
- Making of acrylic teeth
- Kennedy's classification of partial dentures

- Principles of partial denture, design, clasp surveyor, surveying, path of insertion and removal. Establishment of clasp seat. Clasp's parts, classification, function and reciprocation.
- Principles of wire bending, preparation of wrought clasps, occlusal rests and lingual bars.

DENTAL MECHANICS (FINAL):

- Casting machines: Centrifugal and pressure casting machines, Furnaces, Principles of casting.
- Casting techniques of partial denture (skeletal) Clasps, bars, occlusion rest.
- Setting of teeth and completion of dentures on metal skeletons
- Mechanical principles of Orthodontic appliances, anchorage, force, tissue changes and retention
- Stainless steel wire preparation of clasps, springs and Arch wires for Orthodontic appliances
- Use of various types of expansion screws
- **Designing -** Implant supported Prosthesis (if facilities available for Dental Implants)
- **Fabricating -** Maxillofacial prosthesis such as eye, nose, ear, cheek, obturator and splint
- Indirect resin restoration preparation techniques
- Porcelain firing techniques
- Preparation of removable Orthodontic appliances, Activators, Retention appliances and Oral screen
- Construction of fixed Orthodontic appliances, bands, tubes and arches
- Soldering and spot welding - soldering of clasps, tags, strengtheners and lingual bars
- Inlays and crowns - classification and construction facing and backing

- Casting Procedures
- Principles of bridge work - types of abutments - abutments and pontics - construction of bridges using porcelain and acrylic pontics.

DENTAL MATERIALS AND METALLURGY:

Dental Materials:

- Composition, properties, uses, advantages and disadvantages of the following materials: Plaster of paris; Dental Stone, Die Stone
- Investment Materials
- All impression materials
- Tray materials
- Denture base Materials, both for cold curing and heat curing, Tooth material waxes, Base plates
- Zinc Oxide
- Dental Luting Cements
- Dental Cements and indirect resin restoration materials

Dental Metallurgy:

- Metallurgical terms
- General
- Study of:

a) Metals used in dentistry particularly Gold, Silver, Copper, Zinc, Tin, Lead and Aluminium

b) Alloys used in dentistry particularly, casting gold wrought gold silver alloys, stainless steel, chrome cobalt alloys

- Heat treatment - annealing and tempering
- Solders, fluxes, anti fluxes
- Tarnish and corrosion
- Electric deposition

- Dental implant materials

BASIC KNOWLEDGE OF COMPUTERS:

- General office routine economics, record - keeping services, professional referrals and computing skill;
- Record keeping of materials indented and audit of use
- Receipt and dispatch of work from clinicians

PRACTICAL EXAMINATIONS:

The practical examination shall include, but not necessarily limited to the following

1. Primary Examination
    - Model preparation, beading boxing of models
    - Class I ideal denture setup and waxup
    - RPD – surveying of models and wax pattern preparation
    - Spotting of dental materials
    - Manipulation of lab dental materials
2. Final Examination
    I. Three units FPD
        - Model pouring
        - Die - preparation
        - Ditching
        - Spacer application
        - Wax pattern
        - Casting of all metal bridge

    II. Ceramic application on single unit crown (Casted before)