REGULATIONS AND CURRICULUM GOVERNING

DIPLOMA IN DENTAL MECHANIC

(2023)

Yenepoya Dental College

Deralakatte, Mangalore, Karnataka.

NOTIFICATION FROM THE UNIVERSITY



YENEPOYA

University Road, Deralakatte, Mangaluru - 575 018

No. Y/REG/PA/BOM-61/Notification/03/2023 Date: 01.04.2023

NOTIFICATION

Sub: Starting of Diploma Course in Dental Mechanic at Yenepoya Dental College.

Ref: 1.61st BoM (hybrid mode) meeting held on 22nd March 2023 - Agenda 9.
2. Proposal from Yenepoya Dental College dated 4.3.2023
3. Dental Council of India letter dated 23.2.2023.

As discussed under Agenda 9 of the 61st Board of Management meeting held in hybrid mode on 22nd March 2023, the proposal for starting the Diploma Course in Dental Mechanic at Yenepoya Dental College as per the communication received from the Dental Council of India as per Letter No. DCI/PDMS/Misc/Course/DM/6 (122)/2023-24/2023/10246 dated 23.2.2023 is approved and the same is notified.

Dr. Gangadhara Somayaji K.S.
Registrar

Registrar
YENEPOYA
(Deemed to be University)

YENEPOYA
(DEEMED TO BE UNIVERSITY)

CONTENTS

S. No.	Particulars	Page numbers
1.	Preamble	**1**
2.	Definition	**1**
3.	Eligibility for admission	**1**
4.	Duration of the program	**1**
5.	Maximum period for completion of the program	**1**
6.	Aim of the Program	**1**
7.	Objectives/Outcomes of the program	**1 - 3**
8.	Attendance	**3**
9.	Syllabus / Course contents	**3 - 7**
10.	Teaching - Learning methods course-wise	**8**
11.	Scheme of Examination	**8 - 9**
12.	Eligibility to appear for University Examination	**9**
13.	Criteria for passing	**9**
14.	Grading and Classification	**9**
15.	Declaration of Class	**9**
16.	Logbook/Portfolio (if applicable	**10**
17.	Recommended books (In Vancouver style)	**10**
18.	Journals (In Vancouver style)	**10**
19.	Any other information	**10**
20.	Annexures	**10 - 11**

1. Preamble

Laboratory training in dental technology requires the application of a wide range of knowledge and experience in an integrated manner for the provision of appliances for patients. Dental technology is divided into four main areas, fixed Prosthodontics, complete denture technology, removable denture technology and orthodontic technology. The candidates, who choose this career, will have the competency and skill to start their own dental laboratory. They will have job opportunities in various dental colleges. They will have job opportunities in many dental laboratories across the country and globally.

2. Definition

Dental technology is a specialized field focused on the fabrication of dental prosthetics and appliances. Candidates pursuing a career in dental technology will develop a range of competencies and skills, providing them with various professional opportunities.

3. Eligibility for admission

(i) A candidate should be at least 17 years of age at the time of admission or within 3 months of it and should be medically fit to pursue the course.

(ii) The candidate must have passed 10+2 or two years intermediate or equivalent course thereof with Science subjects (i.e.) Physics, Chemistry and Biology from a recognized Indian University or Pre-University/Intermediate Board.

4. Duration of the program

The course of studies should extend over a period of two academic years and lead to the qualification of Dental Mechanics Diploma

5. Maximum period for completion of the program: -----

6. Aim of the Program/Course

The training must produce skilled and qualified dental technicians

7. Objectives/Outcomes of the program *(Knowledge /Skill/ Attitude / Communication)*

Objectives:

- To provide the participants a systematic and logical exposure to dental Laboratory technology.

- To help the participants to effectively plan restorations for dentulous and edentulous patients.
- To Provide skill oriented interactive sessions on laboratory and Prosthetic techniques .

- **Program Outcomes**

- PO1: Develop skills to perform his/her task independently
- PO2: Develop evaluation skill and execute the same
- PO3: Expertise on the application, use and maintenance of the various appliances and machineries used
- PO4: Ability to handle the various dental materials effectively
- PO5: Work independently or in concurrence with dental health care professionals

- **Program Specific Outcomes**

- PO1: Acquire the knowledge and skills to perform their task independently
- PO2: Acquire expertise in use and maintenance of the various appliances and machineries used
- PO3: Understand the work ethics and Work independently or in concurrence with dental health care professionals

Program structure

	Broad category of course	**Hours/Credits**	**Course (Title + Course Code)**
1.	**Discipline-Specific Courses (I Year)**		
a)	Theory	60 Hours	Applied physics, Applied Chemistry and Applied Mechanics
		20 Hours	Applied oral-anatomy
		30 Hours	Dental mechanics
		35 Hours	Dental materials and metallurgy
b)	Practical (SEC)*	40 hours	Applied physics, Applied Chemistry and Applied Mechanics

		90 Hours	Applied Oral Anatomy Skill
		600 Hours	Dental Mechanics
		55 Hours	Dental materials and metallurgy
	Discipline-Specific Courses (II Year)		
	Theory	20 Hours	Dental materials and metallurgy
		30 Hours	Dental Mechanics
		20 Hours	Basic knowledge of computers and Medical Records Management
	Practical (SEC)*	40 Hours	Dental materials and metallurgy
		785 Hours	Dental Mechanics
c)	Clinical (SEC)*		NA
d)	Simulation-based (SEC)*		NA
2.	**Curriculum Enrichment Courses**		
a)	Field Visit		NA
b)	Community Posting		NA
c)	Industry / Clinical Internship		NA
d)	Research Project		NA
3.	**Electives**		NA
a)	Discipline-Specific Electives		NA
b)	Interdisciplinary Courses (*See Notes1*)		NA
c)	Ability Enhancement Courses ● *Soft skills development* ● *Language and communication skill development* ● *Analytical skill development* ● *Personality and professional development* ● *Employability skill development*		NA
d)	Value Added Courses		NA
	Total	**1825 Hours**	

SEC: Skill Enhancement Course

Note 1: Courses from other disciplines

8. Attendance

Candidates attended not less than 75% of the full course of lectures delivered and practical's/demonstrations clinical conducted in each of the subjects of examinations annually.

9. Syllabus / Course contents

First Year

I. Applied physics, Applied Chemistry and Applied Mechanics:
Course outcome: The student should be able to comprehend and apply dental terminology, and technical advancements in the dental laboratory technology profession.

Course Specific Outcomes: The practical application of the knowledge gained in the laboratory materials in the construction of dental prosthesis.

Syllabus:
I. 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 the specific heats of solids and liquids by the method of mixtures.
-Small motors-constructional features and characteristics (Demonstration only)
- Determination of the electro-chemical - equivalent of copper.
2. Applied Mechanics: 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, 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.

3. 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 electro potential series, electroplating, General characteristics of the metals including an elementary study of the common metals and their alloys with special reference to those used in the dental work room.

Alcohol, ethers, adlehydes and ketones, fatty acids and their more important derivatives, amines. Simple treatment of carbohydrates, fats and protetins, Benzens and its homologues. General characteristics of aromatic substances. Synthetic resins and plastics used in Dentistry.

Exercises/Demonstrations:

-Tests for Acids and alkalis radicals.

-Acid base titration- Neutralisation of acids with alkalies. Titration of N/ 10 NaOH with N/10 H2SO4 Phenophthalin or Methyl red as indicator 24

-Total Nitrogen determination in organic nitrogenous materials, digestion and distillation.

-Total Nitrogen determination in In-organic (ammoniacal) solutions (or salts) by direct distillation with Mg.

-Determination of Phosphorus in in-organic materials by precipitation.

-Determination of Potassium in aqueous solution by perchlorate method.

-Electrolytic deposition (electrolysis and electroplating of metals).

(c) Deposition of Copper by electrolysis of copper Sulphate solution.

(d) Calculation of E.C.E.

4. APPLIED ORAL-ANATOMY:

Course outcome: Comprehend the functional and applied anatomy of various structures in the Stomatognathic system.

Course Specific Outcomes: Competent to apply anatomical knowledge to perform laboratory technical procedural skills

Syllabus:

-Elementary anatomy and structure of denture/bearing area.

-Human dentition and occlusion.

-Functions of teeth and morphology of Crowns of teeth.

-Muscles of mastication and facial expression.

-Mastication deglutition and phonation.

- Movements of tempera-mandibular joint.

-Exercise/Demonstrations

-Tooth Carving in wax and plaster. (Crown and root, scale and enlarged models)

5. DENTAL MECHANICS :

Course outcome: Select and utilize specified materials, techniques and instruments in the construction of complete denture, recognizing their limitations and advantages.

Course Specific Outcomes: Competent to apply the knowledge to perform laboratory technical procedural skills in complete denture fabrication.

Syllabus:

-Infection control measures for impressions and models
-Impression Preservation and Boxing-in.
-Cast: Preparation, Trimming, including Orthodontic 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 of casts.
-Articulation, occlusal plane, protrusive balance, working bite, balancing bite, curve of space, compensating curve, lateral curve.
-Principles of the selection of teeth.
- Setting of teeth and wax finishing.
- Flasking, Dewaxing, Packing, curing and Deflasking.
- Finishing and polishing dentures.
-Additions, repairs, relining and revasing 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. Establish a clasp seat. Clasp's parts, classification, function and reciprocation.
- Principles of wire bending, Preparation of wrought clasps, occlusal rests and lingual bars.

Second Year

1. Dental Mechanics:

Course outcome: Select and utilize specified materials, techniques and instruments in the construction of various dental prostheses, recognizing their limitations and advantages. **Course Specific Outcomes:** Competent to fabricate removable, fixed prosthesis, orthodontic appliances and maxillofacial prosthesis.
apply the knowledge to perform laboratory technical procedural skills

Syllabus:

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 Ceramic, laminates and Veneers.

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 & backings.

Casting Procedures.

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

2. DENTAL MATERIALS AND METALLURGY

Course outcome: Attain knowledge about the composition of the metals used in removable prosthodontics and orthodontics

Course Specific Outcomes: Perform laboratory procedures used in fabrication of CPD

Syllabus:

Dental Materials:

Composition, Properties, Uses, Advantages & 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 Materials Waxes, Base Plates,,

Zinc Oxide,

Dental Luting Cements

Dental Ceramics 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 particular y, 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

3. BASIC KNOWLEDGE OF COMPUTERS AND MEDICAL RECORDS MANAGEMENT

Course outcome: identify basic terms, concepts, and functions of computer system components.

Course Specific Outcomes: To be able to the use the computer for basic purposes

Syllabus:

10. Teaching - Learning methods course-wise

-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

Teaching - Learning method	**Courses**
Experiential learning	1.Dental Mechanics
Transmissive method(Lectures)	1.Applied Physics, Applied Chemistry & Mechanics 2. Dental Materials & Metallurgy 3. Applied Oral Anatomy 4. Dental Mechanics 5. Basic knowledge of computers and Medical record management
Method demonstration	1.Applied Oral Anatomy 2.Dental Mechanics

11. Scheme of Examination

a. Internal Assessment (Frequency, Pattern-Theory, and Practical) Theory

	SUBJECTS HAVING MAXIMUM MARKS = 50				**Duration**
Type of question	**Number of questions**	**To be Answered**	**Marks for each question**	**Total**	120 minutes
LONG ESSAY TYPE	02	01	10	10	
SHORT ESSAY TYPE	07	05	04	20	
SHORT ANSWERS	12	10	02	20	

Total	**50**	

Practical:

SI.NO	Components	Marks
1.	Skill Assessment	60
2.	OSPE Stations	20
3.	Viva Voce	20
Total Marks		100

Internal Assessment Components	Maximum Marks(Theory)	Maximum Marks(Practical)
Three IA tests(quarterly)	20	50
Assignment	10	-
Test	20	-
Total Marks	**50**	**50**

12. Eligibility to appear for University Examination

75% of the full course of lectures delivered and practical's/demonstrations

Qualification/eligibility to appointment as Examiners for Dental Mechanic Examinations.

Out of 3 members of the Examining Board, the external and one internal examiner should be a reader in Prosthodontics (MDS) and the third examiner can be a tutor (Dental Mechanics) involved in practical teaching of the course.

Every candidate shall be required to take up all subjects of the examination. A candidate failing in any paper or papers of this examination before being permitted to reappear at the subsequent examination, shall produce evidence of having pursued such a course of training as the Head of the institution may determine. A candidate, who passes in any one or more papers of the examination shall be exempted from appearing in that paper which he/she has, passed and shall be allowed to re-appear in the rest in which he/she has failed in any subsequent examination within a period of two years. Thereafter the candidate will have to appear in all the papers of this examination.

13. Criteria for pass

The minimum number of marks required to pass the examination shall be fifty percent in each paper both in the (i) written with oral and (ii) practical parts of the examination. Candidates who obtain a minimum of seventy-five percent marks in any paper under examination and pass in all three subjects in the first attempt shall be declared to have passed with distinction in a particular subject/s. Candidates who do not pass in all the papers in the first attempt and later obtain the distinction marks shall be declared as passed but without distinction.

The college authority will apply two months in- advance along with a practical examination date sheet to the DCI for recognition of the Diploma Course.

14. Grading & Classification:

50% and above –Pass

75% and above -Distinction

15. Declaration of class:

Candidates who obtain a minimum of 75% of the marks in any paper under examination shall be declared to have passed with distinction in that particular subject provided he/she passes all subjects of examination in the first attempt.

16. Logbook/Portfolio (if applicable)

log book

17. Recommended books (In Vancouver style)

Robert M. Morrow, Kenneth D Rudd. Dental Laboratory Procedures: Volume I Complete Dentures. Elsevier, 2016

2. Rodney D Phoenix, David R Cagna, Charles F deFreest. Stewart's Clinical Removable Partial Prosthodontics. 4th Edition. Quintessence Publishing Co.2014

3.Masahiro Kuwata. Colour atlas of Ceramo-metal technology : MDMI.Inc, 1986

18. Journals (In Vancouver style) –Nil

19. Any other information – Nil

20. Annexures

1. Blueprint for Theory and Practical Examination

University Examination (Pattern-Theory, and Practical)
Year 1

		Written	Oral	Practicals	Total
Paper I	Applied Physics, Chemistry and Mechanics	75	25	-	100
Paper II	Dental Mechanics	75	25	100	200
Paper III	Applied Oral Anatomy	75	25	100	200

Year 1I

		Written	Oral	Practical's	Total
Paper I	Dental Mechanics (Final)	75	25	100	200
Paper II	Dental Materials & Metallurgy	75	25	-	100
Paper III	Basic knowledge of Computer & Medical Records Management	75	25	-	100

2. Question paper layout for theory examinations

Diploma in Dental Mechanics

Instructions:

- **Write the correct question number outside the margins.**
- **Draw suitable diagrams with correct labeling wherever necessary.**
- **Demarcate between answers.**

Date: Time: 3hrs

Marks: 75 Subject: Dental Mechanics

LONG ESSAY (Write any one): **1 x 10 MARKS**

SHORT ESSAYS (Write any *five*): **5 x 5 MARKS**

SHORT ANSWERS (Write any *ten*): **10 x 2 MARKS**

MCQ (ANSWER ALL 20) **20X1MARKS**

3. Logbook template (if applicable)-NA

4. Any other Checklists/Formats for assessment- Nil