DENTAL MATERIALS

Course Title: dental materials

Course Number: DEH 223

Credit Hours: 3 hours

Pre-Requisite: CLS 221/CHS 221/NUR 241

Course Description

This course provides a study of the composition, properties, and uses of non-metal materials as well as the physical and mechanical properties of metal alloys. Topics include gypsums, waxes, acrylics, metals, and impression. Upon completion, students should be able to identify gypsums, waxes, acrylics, and metal materials and know the proper procedures for health, safety,

COURSE OBJECTIVES:

A. Understanding the science of dental materials
B. Identify the various gypsum products, describe their physical and chemical reactions, and demonstrate their proper usage.
C. Identify the various impression materials, describe their physical application, and demonstrate their proper usage.
D. Identify the various dental waxes, describe their physical application, and demonstrate their proper usage.
E. Describe the purpose for separating materials and demonstrate their proper usage.
F. Describe the various types of acrylic resins, their physical and chemical properties, and demonstrate their proper usage.
G. Describe the various dental burs and abrasives, and demonstrate their proper usage.
H. Use appropriate terminology with respect to dental materials.
I. Identify alloys used in dentistry.
J. Define metal structures.
K. Identify dental casting investments.
L. Identify dental soldering investments.
M. Fabricate impressions utilizing alginate, rubber base and hydrocolloid impression materials.

N. Pour and trim master casts form alginate, rubber base and hydrocolloid impressions.

Course outline

Week 1	Introduction to the science of dental materials A. One hour classroom lecture
Week 2 and 3	Gypsum products: (a) Gypsum identification (b) Dental plaster and stone (c) Setting reactions of gypsum products (d) Water/powder ratio (e) Setting time (f) Classification of dental stone (g) Model and die materials (h) Dies (i) Technique A. One hour classroom lecture B. One hour laboratory demonstration
Week 4 and 5	Structure of metals, 1 (a) Crystallization (b) Grain size (c) Crystal structure (d) Phase diagrams A. One hour classroom lecture
Week 6 and 7	Structure of metals, II

	(a) Properties of metal (b) Mechanical working (c) Deformation of metal (d) Methods of testing (e) Metals used in dentistry A. One hour classroom lecture
Week 8	Mid term exam 1
Week 9	Impression materials, I (a) Characteristics (b) Types and uses (c) Alginate technique A. One hour classroom lecture B. One hour laboratory demonstration
Week 10	Impression materials, II (a) Agar base (b) Compounds (c) Impression plaster (d) Metallic oxide impression paste; ZOE (e) Rubber base (mercaptan/polysulfide) (f) Custom impression trays A. One hour classroom lecture B. One hour laboratory demonstration

Week 11	Waxes, separating materials, and debubblizers A. One hour classroom lecture B. One hour laboratory demonstration
Week 12	Denture base acrylic resin (a) Introduction (b) Composition (c) Types and uses (d) Polymerization (e) Molding (f) Physical properties (g) Allergic reactions A. One hour classroom lecture B. One hour laboratory demonstration
Week 13	Dental investments (a) Description of investments (b) Function of investments (c) Types and uses (d) Casting (e) Soldering A. One hour classroom lecture B. One hour laboratory demonstration

Week 14	Mid term exam 2
Week 15	Dental abrasives and polishing agents 1. Description 2. Desirable characteristics of an abrasive 3. Types of abrasives 4. Polishing theory 5. Factors affecting the rate of abrasion 6. Finishing and polishing 7. Electropolishing 8. Dental burs A. One hour classroom lecture
Week 16	Revision
Week 17	Final exam

Teaching methods:

Classroom lecture

Practical at the lab

Evaluation:

2 mid term exam 30%

Practical exam 20%

Attendance 5%

Lab bench clean 5%

Final written exam 40%

Total 100%

References:

1) Laboratory and Clinical Dental Materials, pages 88-l14

2) Removable Prosthodontic Techniques, pages 91-97, 106-109

3) Dental Laboratory Technology, AFM, Volume I, Chapter 3, pages

30-34.

4)Anderson, John N.; Applied Dental Materials, 8rd edition, Blackwell Scientific Publications, 1998.

5) Phillips, Ralph W. Science of Dental Materials. (12th ed.). W. B. Saunders, 1997.