PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

____ Transfer Course _X_ A.A. Degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: DA 60 Dental Materials

UNIT VALUE: 3

MINIMUM NUMBER OF SEMESTER HOURS: 64 hours

BASIC SKILLS REQUIREMENTS: Appropriate language skills

ENTRANCE REQUIREMENTS:

PREREQUISITE: Admission to the Dental Assisting Program

COREQUISITE: None

RECOMMENDED PREPARATION: None

SCOPE OF COURSE:
Chemical properties and uses of dental materials and solutions; manipulative techniques and methods of preparation. *Graded only*

SPECIFIC COURSE OBJECTIVES:

Successful students will be able to:

1. Explain the evolution and development of the science of dental materials.
2. Analyze the American Dental Association Specification and certification program and their importance to the profession and to the public.
3. Explain the importance of dental materials for the dental auxiliary.
4. Justify the purpose of the course in dental materials and your understanding of how it will influence your responsibilities as a registered dental assistant.
5. Analyze the restrictions placed upon the dental manufacturer in the design and fabrication of dental restorations and appliances.
6. Identify the various factors present in the oral cavity which tend to alter the behavior of dental restorations.
7. Explain dental materials in relation to the U.S. Food and Drug Administration.
8. Define the terminology used to discuss the structures and properties of dental materials.
9. Identify the considerations that are involved in the proper selection of restorative materials.
10. Describe the role of hazardous materials and disposal of hazardous waste used in dental practices and the procedures required for safe handling.
11. Compare hydrocolloid impression materials in terms of their composition characteristics and application in dentistry.
12. Compare and contrast the classification system for hydrocolloid impression materials based on (1) method of hardening, (2) elastic handling characteristics and (3) use in dentistry and (4) proper care.

13. Explain the term "thermoplastic" and give a dental material as an example.
14. Explain the manipulation of reversible hydrocolloid in regard to the following (1) required armamentarium (2) preparation of the material (3) removal from the mouth.
15. Explain reversible hydrocolloids.
16. Explain the handling and manipulation of an alginate material. Include proportioning, mixing, removal of tray from mouth, pouring, and separation of the cast.
17. Identify common difficulties and the errors in handling alginate.
18. Identify the factors which influence the setting time of plaster and stone.
19. Describe the steps in the manipulation of stone and the construction of a cast and the importance of proper care, especially as related to moisture contamination.
20. Compare and contrast different chemical types of rubber base impression materials.
21. Identify the common difficulties seen with the elastomeric impression materials and the errors in handling that are most likely related to these problems.
22. Analyze the dental materials made from gypsum. Explain the differences in their structure and properties.
23. Compare dental stone and plaster in terms of water/powder setting time, setting expansion and final strength.
24. Explain the steps in the manipulation of gypsum products and the importance of proper care, especially related to moisture contamination.
25. Identify the following terms relating to metals used in dentistry: alloys, amalgam, cast structure, (wrought structure), soldering flux and welding.
26. Identify the only pure metal used in dentistry and in what forms it is available.
27. Explain the frequency of the use of amalgam as a restorative material.
28. Explain the types of failures seen clinically with amalgam restorations. Analyze the probable factors involved in such failures.
29. Identify the factors controlled by the manufacturer and those controlled by the dentist and auxiliary which influence quality of the final restoration.
30. Explain the factors and precautions associated with proportioning the alloy and mercury and the advantages of pre-weighed disposable capsules.
31. Analyze the potential effect of mercury to (1) the patient and (2) the dentist and auxiliary. List the precautions to be taken to reduce the damage of mercury inhalation in the dental office.
32. Analyze the basic mechanisms of bonding substances and illustrate dental application of each.
33. Describe the difference in the composition of a composite resin compared with an unfilled acrylic direct filling resin.
34. List the serious clinical problems with the unfilled acrylic restorative resins, and how composites solve those problems.
35. Describe the three (3) types of composite resins based on their polymerization systems.
36. Describe the types of visible light-curing units available.
37. Analyze the advantages and disadvantages of enamel and dentin bonding.
38. Identify the steps involved in the complete casting procedure.
39. Explain the difference in the direct and indirect techniques of casting.
40. Compare and contrast classifications of the dental cements and give the uses of each.
41. Identify the significance of the water concentration in the liquid and what precautions must be exercised.
42. Explain the proportioning and manipulation of zinc phosphate cement and influence of the manipulative variable on the properties.
43. Explain the advantages and disadvantages of zinc phosphate and zinc oxide and eugenol.
44. Explain polycarboxylate cement in terms of (1) composition (2) setting reaction, (3) mechanism of adhesion to the tooth (4) and biocompatibility.
45. Compare the most commonly used cavity liners in terms of: composition, characteristics and uses.
46. Identify the primary characteristics and uses of waxes.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:

1. The Council on Dental Materials, Instruments, and Equipment
   - A. Specification Program
   - B. Certification Program
   - C. Acceptance Program
2. Factors making demands on Dental materials
   - A. Biting force
   - B. Temperature change
     1. Expansion
     2. Contraction
   - C. Acidity
   - D. Esthetic factors
   - E. Retention
   - F. Biological limitations
   - G. Microleakage
   - H. Galvanic reaction
3. The Structure and Properties of Dental Materials
   - A. Force
     1. Tensile
     2. Compressive
     3. Shearing
   - B. Elasticity
   - C. Ultimate strength
   - D. Ductility and malleability
   - E. Flow
   - F. Hardness
   - G. Relaxation
   - H. Thermal properties
   - I. Adhesion
     1. Wetting
     2. Viscosity
     3. Film thickness
     4. Surface tension
   - J. Solubility
4. Hazardous Substances
   - A. Occupational Safety and Health Administration (OSHA)
     1. Labeling
     2. Material Safety Data Sheets
     3. Training
     4. Precaution for handling and disposal of hazardous waste.
        - a. General precaution
        - b. General precautions for:
          1. Acid Etch Solution and Gel
          2. Asbestos
          3. Flammable liquids
          4. Gypsum products
          5. Mercury
          6. Metals
          7. Nitrous oxide

8. Organic chemicals
9. Photographic chemicals
10. Visible light cured materials

5. Hydrocolloid Impression Materials
   A. Reversible
   B. Irreversible
6. Impression compounds
   A. stick
   B. tray
7. Zinc oxide impression pastes
   A. Type I
   B. Type II
   C. Bite registration
   D. Surgical pastes
8. Elastomeric Impression Materials
   A. Polysulfide
   B. Silicone
   C. Polysiloxaine
   D. Polyether
   E. Visible light-cure impression materials
9. Gypsum Products
   A. Types
      1. Type I (impression plaster)
      2. Type II (Model plaster)
      3. Type III (stone)
      4. Type IV (High strength stone)
   B. Water/powder ratio
      1. Setting time
      2. Setting Expansion
      3. Strength
10. Metals in Dentistry
   A. Shaping and Joining Metals
      1. Wrought structure
      2. Soldering
      3. Welding
   B. Gold
      1. Pure
      2. Casting
   C. Dental Amalgam
      1. Advantages
      2. Disadvantages
      3. Mercury
      4. Composition
11. Synthetic Resins in Dentistry
   A. Polymerization
   B. Denture base
   C. Temporary crowns and bridges
   D. Custom Impression trays
   E. Orthodontic splints and space retainers
   F. Light-cured materials
   G. Pit and fissure sealants

12. Composite Restorative Materials
    A. Types of Polymerization
        1. Self cured
        2. Light cured
    B. Forms of composites
        1. Macrofilled
        2. Microfilled
        3. Hybrid
    C. Acid Etch Technique
        1. Enamel bonding
        2. Dentin bonding
13. Dental Cements
    A. Zinc Phosphate
        1. Type I
        2. Type II
    B. Zinc-oxide-eugenol
    C. Zinc silicophosphate
    D. Polycarboxylate
    E. Glassionomer
    F. Cavity liners
    G. Cavity varnishes
14. Dental Waxes
    A. Inlay casting waxes
        1. Type I
        2. Type II
    B. Baseplate wax
    C. Occlusal rims
    D. Preformed patterns and molds
    E. Sticky wax
    F. Boxing
    G. Utility
    H. Casting
    I. Bite wafer
    J. Occlusal indicator wax

REQUIRED READING:

Craig, Robert G. Powers, John M. Wataha, John C. Dental Materials. 7th edition. St. Louis: C.V. Mosby Company, 2000.

Torres, H. and A. Ehrlich. Modern Dental Assisting. 7th edition. Philadelphia: W.B. Saunders, 2003.

SUGGESTED READING:

R**EQUIRED WRITING:**

1. A typed research paper on the content of the course.
2. A typed notebook on the terminology and course content

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

INSTRUCTIONAL METHODOLOGY:
Check all that apply:
_x_ lecture
_x_ laboratory
_____ lecture-laboratory combination
_____ directed study

DISTANCE LEARNING:

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.
Yes ____ No_x___

If yes, check all that apply:
_____ Television Course (Video one-way, e.g. ITV, video cassette, etc.)
_____ Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
_____ Two-Way Video Conferencing (Two-way interactive video and audio)
_____ One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
_____ Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

1. The student must pass laboratory evaluations at 75% competency or a substandard grade for the course will be assigned.
2. There are three unit examinations. In addition to the unit examinations there is a comprehensive final examination.

Grading policy is in compliance with college standards described in the Palomar College catalog and the faculty manual.

100-90% = A
89-80% = B
79-70% = C
69-60% = D
59- 0% = F

Tests value	45%
Final value	25%
Notebook value	15%
Research paper value	15%
	100%

IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?
Yes ____ No _x___ Number of times course may be taken for credit: _1

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

CONTACT PERSON: Denise Rudy extension 2573

SIGNATURES ON FILE: