COMMON COURSE OUTLINE:  Course discipline/number/title:  DA 1255: Dental Materials

A.  CATALOG DESCRIPTION
   1. Credits: 4
   2. Hours/Week: 2 hours lecture, 2 hours lab
   3. Prerequisites (Course discipline/number): DA Program admission
   4. Co-requisites (Course discipline/number): None
   5. MnTC Goals (if any): NA

   This course is a study of the properties, uses, and manipulation of chairside and dental laboratory materials. These materials are used in the reconstruction and restoration of the teeth and oral structures. The students will have extensive laboratory experience with the chairside and dental laboratory materials.

B.  DATE LAST REVISED (Month, year): April, 2012

C.  OUTLINE OF MAJOR CONTENT AREAS:
   1. Introduction to Dental Materials
      a) Historical Overview of Dental Materials
      b) Quality Assurance
      c) Structure of Materials
      d) Dental Materials and the Oral Environment
      e) Classification of Dental Materials
      f) Properties of Dental Materials
      g) Ideal Properties/Characteristics
      h) Safety and Hazard Communications in the Dental Lab
   2. Impression Materials
      a) Introduction
      b) Aqueous Elastic Impression Materials
      c) Elastomeric Impression Materials
      d) Inelastic (Plastic) Impression Materials
   3. Synthetic Resins
      a) Introduction
      b) Acrylic Tray Materials
      c) Acrylic Crown Materials
      d) Acrylic Tooth Restorative Materials
      e) Pit and Fissure Sealants
      f) Acrylic Cements
      g) Acrylic Molding Material/Retainer/Splint and Bleaching Tray Materials
      h) Denture Acrylics
   4. Gypsum Materials
      a) Introduction
      b) Types of Gypsum, Characteristics, and Uses
         i. Type I Gypsum
         ii. Type II Gypsum
         iii. Type III Gypsum
         iv. Type IV Gypsum
         v. Type V Gypsum
      c) Model Pouring Techniques
      d) Model Trimming Techniques
      e) Model Disinfection
      f) Articulation Models
   5. Dental Cements and Varnishes
      a) Introduction
      b) Zinc Phosphate Cements
      c) Zinc Oxide Eugenol Cements
      d) Polycrystalline Cements
C. OUTLINE OF MAJOR CONTENT AREAS: Continued.
   e) Glass Ionomer Cements
   f) Resin Cements
   g) Calcium Hydroxide Cements
   h) Cavity Varnishes
   i) Enamel and Dentin Bonding

6. Direct Posterior Restorative Materials
   a) Definition and Types
   b) Amalgam
   c) Composites
   d) Direct Filing Gold
   e) Safety When Using Amalgam

7. Indirect Restorative Materials
   a) Definition and Types
   b) Steps for Preparing the Die and Model for Casting
   c) Steps in the Lost Wax Casting Technique
   d) Other Metals Used in Dentistry

D. LEARNING OUTCOMES (GENERAL): The student will be able to:
1. Demonstrate professional dental assistant traits.
2. Define terms related to dental materials.
3. Demonstrate laboratory safety.
4. Employ infection control, safety, and hazard management protocols.
5. Describe the physical characteristics of matter.
6. Describe the physical properties of matter.
7. Describe the function and use of impression materials.
8. List and describe the classifications of impression materials.
10. Correctly manipulate aqueous impression materials.
11. Describe non-aqueous elastomeric impression materials.
15. Describe the properties and uses of synthetic resins.
16. Describe custom tray materials.
17. Fabricate custom acrylic trays.
18. Describe custom acrylic temporary crown materials.
19. Fabricate custom acrylic temporary crowns.
20. Describe acrylic tooth restorative materials.
22. Describe pit and fissure sealants.
23. Describe acrylic cements.
24. Manipulate acrylic cements.
26. Fabricate a bleaching tray.
27. List and describe the steps in denture construction.
28. Describe the purpose and uses of gypsum materials.
29. Describe the classifications of gypsum materials.
30. Identify the characteristics of each type of gypsum materials.
31. Mix gypsum materials.
32. Pour gypsum models.
33. Trim gypsum models.
34. Disinfect models.
35. Articulate models
36. Describe the uses of dental cements.
37. Describe the characteristics and manipulation of zinc phosphate cements.
D. LEARNING OUTCOMES (GENERAL): The student will be able to: Continued . . .

38. Mix zinc phosphate cements.
39. Describe the characteristics and manipulation of zinc-oxide eugenol cements.
40. Mix zinc-oxide eugenol cements.
41. Describe the characteristics and manipulation of polyacrylic cements.
42. Mix polyacrylic cements.
43. Describe the characteristics and manipulation of glass ionomer cements.
44. Mix glass ionomer cements.
45. Describe the characteristics and manipulation of resin cements.
46. Prepare and manipulate resin cements.
47. Describe the characteristics and manipulation of calcium hydroxide cements.
48. Mix calcium hydroxide cements.
49. Describe the characteristics and manipulation of cavity varnishes.
50. Apply cavity varnishes.
51. Describe the characteristics and manipulation of enamel and dentin bonding agents.
52. Prepare enamel and dentin bonding agents.
53. Identify the types and uses of direct esthetic restorative materials.
54. Describe the characteristics and correct manipulation of direct esthetic restorative materials (composite, glass ionomer, compomers).
55. Identify the types and uses of direct posterior restorative materials.
56. Describe the characteristics and correct manipulation of direct posterior restorative materials (amalgam, composite, direct filling gold).
57. Identify potential hazards when working with dental amalgam.
58. Describe amalgam safe handling techniques.
59. Identify the types and uses of indirect dental restorative materials.
60. Describe dental casting materials.
61. Describe the lost wax casting technique.
62. List the steps in preparing a die and model for casting.
63. List the steps in casting a dental restoration.
64. Describe dental solder and wrought metal techniques in dentistry.

E. LEARNING OUTCOMES (MNTC): NA

F. METHODS FOR EVALUATION OF STUDENT LEARNING:
   1. Weekly written quizzes
   2. Written final exam
   3. Skill performance evaluations
   4. Attendance
   5. Affective behavior.

G. RCTC CORE OUTCOME(S) ADDRESSED:
   - Communication
   - Critical Thinking
   - Global Awareness/Diversity
   - Aesthetic Response
   - Civic Responsibility
   - Personal/Professional Accountability

H. SPECIAL INFORMATION (if any):
   1. Dental Assistant Program Lab Coat
   2. Dental Assistant Program Approved Safety Glasses
   3. Hair controlled (pulled back) out of the work area.
   4. The use of safety glasses, masks, and gloves will be required when working with specified dental materials.
   5. Each student must have had the “Dental Lab Safety Seminar” prior to performing in the dental lab.