College of San Mateo
Official Course Outline

1. **COURSE ID:** DENT 721  **TITLE:** Dental Materials I  
   **Units:** 3.0 units  **Hours/Semester:** 32.0-36.0 Lecture hours; and 48.0-54.0 Lab hours  
   **Method of Grading:** Letter Grade Only  
   **Prerequisite:** Acceptance to the Dental Assisting Program

2. **COURSE DESIGNATION:**  
   Degree Credit  
   Transfer credit: none

3. **COURSE DESCRIPTIONS:**  
   **Catalog Description:**  
   This course introduces the student to the vast subject of dental materials and dental laboratory procedures and equipment. Safety measures and protocol are taught in a laboratory setting. This course provides instruction in dental cements, restorative materials, impression materials, gypsum products, and their physical and chemical properties. Students develop the skills necessary for materials manipulation in both the dental laboratory and the treatment room. The purchase of a Fall Dental Materials Student Kit is required; details provided in class. (This course is offered in the Fall only.)

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**  
   Upon successful completion of this course, a student will meet the following outcomes:  
   1. Identify and describe how the properties of the oral cavity relate to dental material selection.  
   2. Demonstrate the ability to mix any dental cement, liner, or impression material taught during the fall semester & utilized at UOP Dental School.  
   3. Describe the use of amalgam & composite materials needed for restorative procedures.  
   4. Identify the uses, indications and contraindications of dental cements in dentistry for medications, bases, luting agents, restorative agents.  
   5. Describe the requirements for the dental impression material for final impressions  
   6. Demonstrate the technique for taking alginate impression and bite registrations.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**  
   Upon successful completion of this course, a student will be able to:  
   1. Describe what materials are used as cavity liners and bases.  
   2. Describe acid etch and bonding.  
   3. Describe the uses of the most commonly utilized dental cements including their manipulation.  
   4. Describe the primary purposes of each component of amalgam alloy. Also identify the importance of the role of mercury/alloy ratio and setting reaction.  
   5. Identify and [care for all dental laboratory armamentarium and equipment.  
   7. Differentiate "temporary, final and sedative cements".  
   8. Operate and care for hydrocolloid conditioning units and hydrobaths.  
   9. Compare and manipulate all dental impression materials including their uses, as relating to prosthodontics.  
   10. Identify the following terms relating to polymethylmethacrylates: synthetic resins, acrylics, polymer, monomer, polymerization, self-cured, light-cured, heat-cured.  
   11. Construct a custom acrylic tray.  
   12. Manipulate type IV gypsum.  
   13. Demonstrate pouring, separating and trinuning maxillary and mandibular costs.  
   14. Describe the hazards of incorrect handling of mercury and discuss mercury hygiene.  
   15. Describe and apply cavity varnish.  
   16. Identify and define the following physical properties: force, stress, tensile stress, ductility and malleability, hardness, relaxation and describe why they are important to dental materials.  
   17. Describe preventive dental materials.  
   18. Demonstrate obtaining maxillary and mandibular alginate impressions for study.

6. **COURSE CONTENT:**  
   **Lecture Content:**  
   1. Introduction to Dental Materials
A. Safety factors
B. Lab equipment
C. Physical properties
D. Requirements of dental materials

2. Dental Cements
A. Uses
B. Bases and liners
C. Temporary cements
D. Final cements
E. Restorative cements
F. Special applications
   a. Root canal sealer
   b. Gingival tissue pack
   c. Surgical dressing
   d. Cementation of orthodontic bands
   e. Orthodontic direct bonding
   f. Cementation of resin-bonding bridges

3. Cavity Varnishes

4. Restorative Materials
   A. Amalgam
      a. Properties
      b. Examples
         i. Pre-measured
         ii. Filings
         iii. Pellets
      c. Uses
      d. Proportioning of mercury and alloy
      e. Methods and factors in mixing
      f. Mercury handling
   B. Direct esthetic restorative materials
      a. Composite restoratives
         i. Self-polymerizing
         ii. Heat
         iii. Light-polymerizing
      b. Acid etch/bonding
      c. Ionomer restoratives
   C. Gold and nonprecious alloys
      1. Gold foil
      2. Introduction to casting alloys

5. Impression Materials
   A. Classifications
   B. Hydrocolloids
      a. Packaging
      b. Properties
      c. Manipulation
      d. Equipment
   C. Polysulfide rubber impression materials
      a. Composition
      b. Properties
      c. Manipulation
   D. Silicone rubber impression materials
      a. Composition
      b. Properties
      c. Manipulation
   E. Polyether rubber impression material
      a. Composition and setting reaction
      b. Properties
      c. Manipulation
   F. Vinyl polysiloxane
a. Composition
b. Properties
c. Manipulation

6. Gypsum Products
   A. Model plaster
   B. Dental stone
   C. Dental stone high-strength
   D. Chemical and physical nature
   E. Properties
   F. Manipulation
   G. Trimming
   H. Polishing

Lab Content:
1. Identification of Dental Materials Lab
   A. Safety factors
   B. Lab equipment

2. Dental Cements
   A. Identification
   B. Measurement
   C. Manipulation

3. Cavity Varnishes
   a. Application

4. Restorative Materials
   a. Amalgam
   b. Pre-measured
      i. Methods and factors in mixing
      ii. Mercury handling

5. Composite Restoratives
   a. Self-polymerizing
   b. Heat
   c. Light-polymerizing
   d. Acid etch/bonding

6. Impression Materials
   A. Hydrocolloids
      a. Packaging
      b. Manipulation
      c. Equipment
   B. Polysulfide rubber impression materials
      a. Composition
      b. Manipulation
   C. Silicone rubber impression materials
      a. Composition
      b. Manipulation
   D. Polyether rubber impression material
      a. Composition and setting reaction
      b. Manipulation
   E. Vinyl Polysiloxane
      a. Composition
      b. Manipulation

7. Gypsum Products
   A. Model plaster
   B. Dental stone
   C. Dental stone high-strength
   D. Chemical and physical nature
   E. Manipulation
   F. Trimming
   G. Polishing

7. REPRESENTATIVE METHODS OF INSTRUCTION:
   Typical methods of instruction may include:
A. Lecture
B. Lab
C. Other (Specify): Lectures, power point presentations, videos, group discussions, demonstrations in lab.

8. REPRESENTATIVE ASSIGNMENTS
Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:
Weekly workbook assignments assigned to correspond to the reading assignments

Reading Assignments:
Weekly reading assignments from the text (8-15 pages) along with workbook assignments

9. REPRESENTATIVE METHODS OF EVALUATION
Representative methods of evaluation may include:
A. Class Participation
B. Exams/Tests
C. Homework
D. Lab Activities
E. Quizzes
F. Students will be evaluated as based on participation in class (both lecture and lab), completion of
workbook and worksheet homework assignments, quizzes, competencies on lab work and skills, lab
projects with and without lab partners, and final examinations.

10. REPRESENTATIVE TEXT(S):
Possible textbooks include:
B. Carol Dixon Hatrick CDA RDA RDH MS, W. Stephan Eakle DDS FADM. Dental Materials: Clinical

Origination Date: October 2015
Curriculum Committee Approval Date: December 2015
Effective Term: Fall 2016
Course Originator: Beth LaRochelle