DH R032: DENTAL MATERIALS FOR DENTAL HYGIENE

Originator
aderdiarian

Co-Contributor(s)

Name(s)
Enriquez, Richard (renriquez)

College
Oxnard College

Discipline (CB01A)
DH - Dental Hygiene

Course Number (CB01B)
R032

Course Title (CB02)
Dental Materials for Dental Hygiene

Banner/Short Title
Dental Materials for DH

Credit Type
Credit

Start Term
Fall 2021

Catalog Course Description
This course teaches the composition and application of various materials used in dental procedures. The fundamentals of chairside assisting while using dental materials are taught and the roles of the entire dental team in working with various dental materials in the care of oral dentition are covered.

Taxonomy of Programs (TOP) Code (CB03)
1240.20 - *Dental Hygienist

Course Credit Status (CB04)
D (Credit - Degree Applicable)

Course Transfer Status (CB05) (select one only)
C (Not transferable)

Course Basic Skills Status (CB08)
N - The Course is Not a Basic Skills Course

SAM Priority Code (CB09)
C - Clearly Occupational

Course Cooperative Work Experience Education Status (CB10)
N - Is Not Part of a Cooperative Work Experience Education Program

Course Classification Status (CB11)
Y - Credit Course

Educational Assistance Class Instruction (Approved Special Class) (CB13)
N - The Course is Not an Approved Special Class

Course Prior to Transfer Level (CB21)
Y - Not Applicable

Course Noncredit Category (CB22)
Y - Credit Course

Funding Agency Category (CB23)
Y - Not Applicable (Funding Not Used)

Course Program Status (CB24)
1 - Program Applicable

General Education Status (CB25)
Y - Not Applicable

Support Course Status (CB26)
N - Course is not a support course

Field trips
May be required

Grading method
Letter Graded

Does this course require an instructional materials fee?
No

Repeatable for Credit
No

Is this course part of a family?
No

Units and Hours

Carnegie Unit Override
No

In-Class

Lecture
Minimum Contact/In-Class Lecture Hours
17.5
Maximum Contact/In-Class Lecture Hours
17.5

Activity

Laboratory
Minimum Contact/In-Class Laboratory Hours
52.5
Maximum Contact/In-Class Laboratory Hours
52.5

Total in-Class

Total in-Class
Total Minimum Contact/In-Class Hours
70

Total Maximum Contact/In-Class Hours
70

Outside-of-Class

Internship/Cooperative Work Experience

Paid

Unpaid

Total Outside-of-Class

Total Outside-of-Class
Minimum Outside-of-Class Hours
35
Maximum Outside-of-Class Hours
35

Total Student Learning

Total Student Learning
Total Minimum Student Learning Hours
105
Total Maximum Student Learning Hours
105

Minimum Units (CB07)
2
Maximum Units (CB06)
2

Prerequisites
DH R020 and DH R021 and DH R022 and DH R023 and DH R024 and DH R025

Corequisites
DH R030 and DH R031 and DH R033 and DH R034 and DH R035 and DH R036

Limitations on Enrollment
Current CPR certification for health care provider (American Heart Association) or professional rescuer (American Red Cross)
Proof of freedom from and immunity to communicable diseases
No acrylic or long nails in clinical settings
Current negative TB test or chest x-ray
Physical examination demonstrating general good health
No visible tattoos or visible body piercings except single studs in earlobes

Entrance Skills

Entrance Skills
Students must have basic understanding of the physical sciences (Chemistry, Physics) in order to understand the various properties (physical, chemical, mechanical) of the array of dental materials commonly used in the dental office. They should be able to appreciate the effects of the oral environment on the materials used to restore or replace oral tissues.

Prerequisite Course Objectives
DH R020-Explain the pharmacology, physiology, and proper use of local anesthetic agents
DH R020-Analyze the anatomy of the trigeminal nerve, physiology of nerve conduction, and how anesthesia works
DH R020-Explain the armamentarium for local anesthesia injections
DH R020-Demonstrate techniques used in anesthesia injections in dentistry
DH R020-Explain procedures for the prevention of emergencies
DH R020-Demonstrate competency in the management of medical and dental emergencies
DH R020-Demonstrate competency in the application of nitrous oxide

DH R021-Identify and explain the various pathological processes of disease, inflammation, immunology defense, degeneration, neoplasm, developmental disorders, and healing and repairs
DH R021-Recognize abnormalities in the human body with a special emphasis on normal and abnormal conditions in the oral cavity
DH R021-Explain the body processes involved in disease formation and the systems the body employs in its defense
DH R021-Identify etiologic factors and the signs and symptoms that are associated with diseases
DH R021-Describe the body systems responsible for adaptation, wound healing, and repair
DH R021-Recognize abnormal oral or health related conditions that must be called to the attention of a dentist or those that preclude, or alter, dental hygiene practice
DH R021-Analyze the social and economic significance of disease and disease control
DH R021-Report major disease entities with emphasis on those that occur in the oral cavity
DH R021-Appraise the degenerative and regenerative processes associated with pathogenesis
DH R021-Examine oral tissues and recognize a deviation from normal that may be present
DH R022-Identify the acts and the regulatory agencies within the federal government that affect the use of medications.
DH R022-Select and discuss drug information references available to research information.
DH R022-Identify the format of a prescription and the common abbreviations used.
DH R022-Describe basic mechanisms of drug action, including receptor-mediated and receptor-independent actions, agonists and antagonists and dose–effect relationships.
DH R022-Define the basic principles of pharmacokinetics within the body.
DH R022-Identify factors that influence the pharmacokinetics of drugs.
DH R022-Evaluate therapeutic applications of drugs, including routes of administration and variables that affect drug response.
DH R022-Interpret pharmacologic effects, adverse reactions, contraindications and general methods of toxicity prevention.
DH R022-Research the mechanism and classification of drug interactions.
DH R022-Review the toxicological evaluation of drugs.
DH R022-Identify factors that may alter the effect of a medication.
DH R022-Define ways in which medications are named (brand, generic or chemical) and the significance of each.
DH R022-Analyze the pharmacological effects of each category of drugs as well as their mechanism of action.
DH R022-Describe the adverse reactions, contraindications and drug interactions for each category of drugs.
DH R022-Identify dental considerations and modifications to treatment that might be necessary based on the specific drug category.
DH R022-Identify medications by name (generic and brand) that fall within each of the categories of medications
DH R022-Gain an appreciation for the role of research in evidence-based dental hygiene practice.
DH R023-Provide beginning treatment of adult and child patients
DH R023-Demonstrate various clinical procedures utilizing scaling and polishing techniques
DH R023-Demonstrate extraoral and intraoral inspections, cancer screening, and dental and periodontal charting
DH R023-Deliver plaque control instruction
DH R023-Demonstrate and explain fluoride applications
DH R024-Describe rationale, method, routine and scientific basis for dental hygiene procedures
DH R024-Describe what emergency situations may arise in a clinical situation and how they may be addressed
DH R024-Manage dental hygiene treatment planning
DH R024-Describe the signs, symptoms, and treatments of carpal tunnel syndrome and its effects on the practicing dental hygienist
DH R024-Describe instrumentation techniques and instrument selection appropriate for patient treatment
DH R024-Analyze and describe methods and techniques of plaque control
DH R024-Describe instrument sharpening techniques
DH R024-Analyze fluorides and their effects on and use in patient treatment
DH R024-Interpret pertinent patient treatment sequencing and present findings
DH R024-Analyze and describe correct radiology techniques used in exposing, developing, mounting, and critiquing radiographs
DH R024-Describe and assess current clinical issues of concern
DH R024-Analyze dental hygiene clinical cases and determine patient and clinician needs appropriate for the case
DH R025-Describe sequentially the embryonic and histologic development of the periodontium
DH R025-List and recognize the clinical, histologic and radiographic features of periodontal health and the varying classifications of gingivitis and periodontitis
DH R025-Describe the functions of the periodontium, including the gingiva (attached and unattached), cementum, crevicular fluid, junctional epithelium, periodontal ligament and alveolar bone.
DH R025-List, describe and differentiate various periodontal diseases in a classification system as established by the American Academy of Periodontology.
DH R025-Identify periodontal risk factors that affect onset, progression and severity of periodontal diseases
DH R025-Identify periodontal risk factors that are acquired, environment and genetic.
DH R025-Evaluate potential periodontal interrelationships to include: stroke, coronary heart disease, respiratory disease, diabetes, preterm low birth weight deliveries and other conditions associated with progression of periodontal disease.
DH R025-Explain the interplay between periodontal pathogens and the host tissues.
DH R025-Describe the stages of development bacterial colonization and composition of human supragingival and subgingival biofilm.
DH R025-Explain microbiologic and immunologic interactions of the host in periodontal disease.
DH R025-Describe the sequential development of inflammatory periodontal disease.
DH R025-Define and describe various evaluative methods (probing, clinical attachment levels, bleeding and exudate, mobility, etc.) needed to measure variations from periodontal health.
DH R025-Recognize the rationale, objectives and therapies involved in the various levels of dental hygiene care (preventive oral prophylaxis, therapeutic root debridement and professional periodontal maintenance).
DH R025-Explain the role of the re-evaluation appointment in determining the next phase of periodontal treatment.
DH R025-Describe the components of the re-evaluation appointment.

Requisite Justification

Requisite Type
Prerequisite

Requisite
DH R020

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Prerequisite

Requisite
DH R021

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Prerequisite

Requisite
DH R023

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Prerequisite

Requisite
DH R024

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Prerequisite

Requisite
DH R025

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Corequisite

Requisite
DH R030

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Corequisite

Requisite
DH R031

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Corequisite

Requisite
DH R033

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Corequisite

Requisite
DH R034

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Corequisite

Requisite
DH R035

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Requisite Type
Corequisite

Requisite
DH R036

Requisite Description
Course in a sequence

Level of Scrutiny/Justification
Content review

Student Learning Outcomes (CSLOs)

	Upon satisfactory completion of the course, students will be able to:
1	Students will be able to differentiate between various properties of materials used in dentistry.
2	Students will be able to determine the correct impression material for a specific dental procedure
3	Student will be able to demonstrate the use of laboratory equipment for fabrication of oral appliances.
4	Student will be able to describe the components of composites and adhesive materials used in restorative dentistry.

Course Objectives

	Upon satisfactory completion of the course, students will be able to:
1	Explain and distinguish between the various restorative materials used in dentistry
2	Assess the physical, electrical, and mechanical properties of materials used in dentistry
3	Explain the effects the oral environment may have on dental materials, as well as the effect dental materials may have on the oral environment
4	Explain the role preventive dental materials play in preventing oral diseases
5	Assess the various types of materials used for esthetic dental restorations
6	Compare the role amalgam restorations have played in restorative dentistry in the past and what role they have in the present and the future
7	Explain the amalgamation process and all related health concerns
8	Identify the finishing, polishing, and cleansing materials used in dentistry
9	Mix dental cements to proper consistency in a reasonable length of time
10	Indicate the significance of accuracy in using impression materials and restorative materials
11	Create a model cast or die used in dentistry to duplicate accurately the hard and/or soft oral tissues
12	Define and describe the various types of waxes used in dentistry
13	Categorize the noble metals used for restorative materials, prosthetic appliances, and crown and bridge fabrication
14	Explain the role of plastics in prosthetic dentistry
15	Explain the legal and ethical ramifications of different levels of treatment

Course Content

Lecture/Course Content

1. Introduction to Dental Materials
   a. State concepts and objectives of restorative dentistry
   b. Relate the various properties of dental materials to their use in restorative dentistry

   c. State reasons why no single restorative material is suitable for all restorations
   d. State the different properties are required for anterior and posterior restorations
   e. State the rational for the use of a cement base in the restoration of some teeth
   f. State the advantages of a porcelain fused to metal crown
   g. List the essential properties required of metals for dental bridges
   h. Correctly identify dental restorations when a large number of teeth or all the teeth are missing from a dental arch
   i. Safety in the dental laboratory
   j. Dental laboratory equipment
2. Properties of Dental Materials
   a. Mechanical properties
   b. Thermal change
   c. Electric properties
   d. Corrosive properties
   e. Solubility
   f. Application properties
3. Preventive Dental Materials
   a. Indicate the components in fluoride gels, rinses, and varnishes
   b. Compare the characteristics of different types of fluoride treatments
   c. Describe the clinical effectiveness of fluoride gels
   d. List the steps in applying fluoride gels
4. Pit and Fissure Sealants
   a. Describe the uniqueness of pit and fissure x=caries compared to smooth-surface caries
   b. List the components in light activated and amine accelerated resin sealants and indicate their function
   c. Describe factors that effect the penetration of a sealant into a fissure
   d. Discuss the retention and efficacy of sealants
   e. Understand safety concerns for the light curing units
5. Esthetic Restorative Materials
   a. List the various types of esthetic materials available for restorations
      i. Composites
      ii. Veneers
      iii. Inlays
      iv. On lays
      v. PFM's
      vi. Bridges
      vii. Implants
      viii. Indirect versus direct restorations.
6. Impression Materials
   a. Classifications of Impressions
      i. Preliminary impressions
      ii. Final impression
      iii. Bite registration
7. Irreversible Hydrocolloid Materials
   a. Procedure-mixing alginate impression
   b. Taking maxillary and mandibular impressions
8. Bonding Agents
   a. Indicate components used in bonding
   b. Describe properties of bonding agents and indicate their clinical importance
   c. Describe the manipulation of bonding agents
9. Hybrid Ionomers
   a. Describe the uses of glass ionomers
   b. Indicate components used in glass ionomers
   c. Describe the properties of glass ionomers
10. Amalgams
11. Finishing and Polishing Materials
12. Impression Materials
13. Waxes, Model, and Die Materials
14. Cements
15. Gold and Non-Precious Alloy

16. Dental Casting of Metals, Direct and Indirect Techniques
17. Prosthetic Materials
18. Esthetic Materials, Latest on Veneers, Laminates, and Whitening
19. Lasers and Implants

Laboratory or Activity Content

1. Introduction to Dental Materials in the Lab
    a. Safety in the dental laboratory
    b. Dental laboratory equipment
2. Preventive Dental Materials

1.Dental sealants
2. Splints
C. Impression Materials
1. Irreversible hydrocolloid
a. Take impression
b. Pour impression
c. Trim models
D. Restorative dental materials
Direct restorations -- Amalgam vs. Composite restorations
Indirect restorations-- Cast inlay vs. Onlay Metal vs. Ceramics
E. Impression materials
Reversible hyrocolloid vs. Irreversible hydrocolloid
Elastomeric impression materials
F. Mixing cements/restorative materials
1. Glass ionomer
2. Carboxylate cements
G. Zoom Whitening Procedure

Methods of Evaluation

Which of these methods will students use to demonstrate proficiency in the subject matter of this course? (Check all that apply):

Problem solving exercises
Skills demonstrations

Methods of Evaluation may include, but are not limited to, the following typical classroom assessment techniques/required assignments (check as many as are deemed appropriate):

Clinical demonstration
Group projects
Individual projects
Laboratory activities
Objective exams
Performances
Projects
Problem-Solving Assignments
Quizzes
Skills demonstrations
Skill tests or practical examinations

Instructional Methodology

Specify the methods of instruction that may be employed in this course

Audio-visual presentations
Collaborative group work
Clinical demonstrations
Class activities
Distance Education
Demonstrations
Instructor-guided interpretation and analysis
Instructor-guided use of technology
Laboratory activities

Lecture

Describe specific examples of the methods the instructor will use:
Lectures combined with YouTube videos to demonstrate lab procedures.
YouTube videos to illustrate practical examples of various properties of dental materials.
Demonstrations of lab procedures

Representative Course Assignments

Writing Assignments
There are no written assignments or outside assignments in this lecture/lab course

Critical Thinking Assignments
Explain lab assignment, demonstrate assignment then have students perform the procedure and critically think their way through any problems they may have doing the procedure.

Reading Assignments
1. Students will spend a minimum of 2 hours per week outside the regular class time doing reading on assigned topics like the use of temporary filling materials

Skills Demonstrations
Students will perform lab evaluations and competencies on numerous procedures related to dental materials used in the dental offices.
Completion of various laboratory exercises, such as taking impressions, pouring and trimming mouth models

Other assignments (if applicable)
There are no written assignments or outside assignments in this lecture/lab course

Outside Assignments

Articulation

Attach Syllabus
DH32Syll19.doc

District General Education

A. Natural Sciences

B. Social and Behavioral Sciences

C. Humanities

D. Language and Rationality

E. Health and Physical Education/Kinesiology

F. Ethnic Studies/Gender Studies

CSU GE-Breadth

Area A: English Language Communication and Critical Thinking

Area B: Scientific Inquiry and Quantitative Reasoning

Area C: Arts and Humanities

Area D: Social Sciences

Area E: Lifelong Learning and Self-Development

Area F: Ethnic Studies

CSU Graduation Requirement in U.S. History, Constitution and American Ideals:

IGETC

Area 1: English Communication

Area 2A: Mathematical Concepts & Quantitative Reasoning

Area 3: Arts and Humanities

Area 4: Social and Behavioral Sciences

Area 5: Physical and Biological Sciences

Area 6: Languages Other than English (LOTE)

Textbooks and Lab Manuals

Resource Type
Textbook

Classic Textbook
Yes

Description
Powers, John. (2017). *Dental Materials: Properties and Manipulation* (11th Edit.) Elsevier

Library Resources

Sufficient Library Resources exist
Yes

Distance Education Addendum

Definitions

Distance Education Modalities

Hybrid (51%–99% online)
Hybrid (1%–50% online)
100% online

Faculty Certifications

Faculty assigned to teach Hybrid or Fully Online sections of this course will receive training in how to satisfy the Federal and state regulations governing regular effective/substantive contact for distance education. The training will include common elements in the district-supported learning management system (LMS), online teaching methods, regular effective/substantive contact, and best practices.

Yes

Faculty assigned to teach Hybrid or Fully Online sections of this course will meet with the EAC Alternate Media Specialist to ensure that the course content meets the required Federal and state accessibility standards for access by students with disabilities. Common areas for discussion include accessibility of PDF files, images, captioning of videos, Power Point presentations, math and scientific notation, and ensuring the use of style mark-up in Word documents.

Yes

Regular Effective/Substantive Contact

Hybrid (1%–50% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Other DE (e.g., recorded lectures)	Students are to do all reading assignments prior to viewing recorded lectures evidenced by submitting an outline of the Chapter and answers to review questions. Then and only then will recorded lectures be made available on Canvas. Questions will be submitted to me on Canvas and discussed during video conferences. Edited PowerPoint slides will be posted for instructional guidance.

Hybrid (51%–99% online) Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Video Conferencing	Students are to do all reading assignments prior to viewing recorded lectures evidenced by submitting an outline of the Chapter and answers to review questions. Then and only then will recorded lectures be made available on Canvas. Questions will be submitted to me on Canvas and discussed during video conferences. Edited PowerPoint slides will be posted for instructional guidance. Students come to video conference with assigned Active Learning Assignments (ALA's) completed for use in collaborative group work and small group activities. Most ALA's are either outlines of the Chapt. or Review Questions from the Chapt. Additionally they are to write quizz questions as the read the assignment.

100% online Modality:

Method of Instruction	Document typical activities or assignments for each method of instruction
Video Conferencing	Video conferences will be utilized to present my introductory lecture for the Chapt. for instructural guidance and later for discussion and clarification. Students come to video conference with assigned Active Learning Assignments (ALA's) completed for use in collaborative group work and small group activities. Most ALA's are either outlines of the Chapt. or Review Questions from the Chapt. Additionally they are to write quizz questions as the read the assignment.

Examinations

Hybrid (1%–50% online) Modality
Online

Hybrid (51%–99% online) Modality
Online

Primary Minimum Qualification
DENTAL TECHNOLOGY

Additional local certifications required
Dental Hygiene faculty members must comply with the requirements set by the Commission on Dental Accreditation (CODA). CODA requires that program faculty member providing didactic instruction must have earned at least a baccalaureate degree in a discipline-related field. All dental hygiene faculty members must have current knowledge of the specific subjects they are teaching and documented background in educational methodology consistent with their teaching assignments. Dentists and dental hygienists who supervise students' clinical procedures should have qualifications which comply with the state dental or dental hygiene act. Individuals who teach and supervise dental hygiene students in clinical enrichment experiences should have qualifications comparable to faculty who teach in the dental hygiene clinic and are familiar with the program's objectives, content, instructional methods and evaluation procedures.

Review and Approval Dates

Department Chair
05/01/2020

Dean
05/07/2020

Technical Review
05/13/2020

Curriculum Committee
05/13/2020

DTRW-I
02/10/2021

Curriculum Committee
12/09/2020

Board
03/09/2021

CCCCO
MM/DD/YYYY

Control Number
CCC000109881

DOE/accreditation approval date
MM/DD/YYYY