

# COURSE OUTLINE

## OXNARD COLLEGE

- I. Course Identification and Justification:
- A. Proposed course id: DH R011  
Banner title: Oral Radiology for DH  
Full title: Oral Radiology for Dental Hygiene  
  
Previous course id: DH R011  
Banner title: Oral Radiology  
Full title: Oral Radiology
  - B. Reason(s) course is offered:  
DH R011 fulfills a requirement for the AS degree. Oral radiology has been an important core course since the founding of the Oxnard College Dental Hygiene Program. The course is required to introduce the dental hygiene student to the taking and interpreting of dental radiographs. This course presents the opportunity for the dental hygiene student to gain certification to legally take radiographs on patients.
  - C. Reason(s) for current outline revision:  
5 year update; update title, change prerequisite sentence to list of program prereq courses; add program recommendations as prereqs
  - D. C-ID:
    - 1. C-ID Descriptor:
    - 2. C-ID Status: Not Applicable
  - E. Co-listed as:  
*Current:* None  
*Previous:*
- II. Catalog Information:
- A. Units:  
*Current:* 3.00  
*Previous:* 3.00
  - B. Course Hours:
    - 1. In-Class Contact Hours:  
Lecture: 35    Activity: 0    Lab: 52.5
    - 2. Total In-Class Contact Hours: 87.5
    - 3. Total Outside-of-Class Hours: 70
    - 4. Total Student Learning Hours: 157.5
  - C. Prerequisites, Corequisites, Advisories, and Limitations on Enrollment:
    - 1. Prerequisites  
*Current:*

ENGL R101H: Honors: College Composition and  
PHSO R101: Human Physiology and  
SOC R108: Sociology of the Chicano Community  
SJS R110: Introduction to Social Justice Studies or  
ECE R107: Teaching in a Diverse Society or  
CHST R101: Introduction to Chicana/o Studies or  
ANTH R114: African American Culture and Experience or  
ANTH R102H: Honors: Introduction to Cultural Anthropology or  
ANTH R102: Introduction to Cultural Anthropology or  
PSY R101: General Psychology and  
MICR R100L: Principles of Microbiology Laboratory and  
COMM R101: Introduction to Oral Communication and  
ANAT R101: General Human Anatomy and  
MATH R033: Pathway to STEM and  
MATH R014: Intermediate Algebra or  
BIOL R101: General Biology or  
SOC R103: Race and Ethnic Relations or  
SOC R101: Introduction to Sociology and  
MICR R100: Principles of Microbiology and  
ENGL R101: College Composition or  
CHEM R112: Elementary Organic and Biological Chemistry and  
CHEM R110: Elementary Chemistry and  
BIOL R101L: General Biology Laboratory and  
BIOL R101H: Honors: General Biology and  
DH R001: Pre-Dental Hygiene  
*Previous:*  
DH R001: Pre-Dental Hygiene

2. Corequisites

*Current:*

DH R010: Oral Biology for Dental Hygiene and  
DH R014: Introduction to Dental Hygiene Practice and  
DH R012: Head and Neck Anatomy for Dental Hygiene and  
DH R013: Dental Health Education Seminar for Dental Hygiene and  
DH R015: Introduction to PreClinic/Clinic for Dental Hygiene

*Previous:*

DH R010: Oral Biology for Dental Hygiene  
DH R012: Head and Neck Anatomy for Dental Hygiene  
DH R013: Dental Health Education Seminar for Dental Hygiene  
DH R014: Introduction to Dental Hygiene Practice  
DH R015: Introduction to PreClinic/Clinic for Dental Hygiene

3. Advisories:

*Current:*

CIS R020A: Introduction to Microcomputers

*Previous:*

MATH R011: Elementary Algebra or  
MATH R011A: Elementary Algebra I and  
MATH R011B: Elementary Algebra II  
BIOL R101: General Biology and  
BIOL R101L: General Biology Laboratory  
CIS R020A: Introduction to Microcomputers

4. Limitations on Enrollment:

*Current:*

Admission to the dental hygiene program and physical/clinical examination (with

the last 12 months) with CBC and urinalysis verifying physical fitness: non-reactive VDRL or RPR; negative Tuberculosis Mantoux test or negative chest x-ray; Hepatitis B vaccine & titer showing immunity; Tetanus vaccine; MMR vaccine or titers showing immunity to Rubella and Rubeola; Varicella titer showing immunity; CPR certification and

*Previous:*

Completion of program prerequisites as stipulated by the Commission on Dental Accreditation and DH R001 Pre-Dental Hygiene and Admission to the dental hygiene program and physical/clinical examination (with the last 12 months) with CBC and urinalysis verifying physical fitness: non-reactive VDRL or RPR; negative Tuberculosis Mantoux test or negative chest x-ray; Hepatitis B vaccine & titer showing immunity; Tetanus vaccine; MMR vaccine or titers showing immunity to Rubella and Rubeola; Varicella titer showing immunity; CPR certification

D. Catalog description:

*Current:*

This course teaches the fundamentals of radiation safety and the operation of dental radiology equipment, along with the clinical application of procedures involved in exposing, processing, mounting and interpreting dental radiographs. This course presents the opportunity to gain certification to legally take dental radiographs

*Previous, if different:*

E. Fees:

*Current:* \$ None

*Previous, if different:* \$

F. Field trips:

*Current:*

Will be required: [ ]

May be required: [X]

Will not be required: [ ]

*Previous, if different:*

Will be required: [ ]

May be required: [ ]

Will not be required: [ ]

G. Repeatability:

*Current:*

A - Not designed as repeatable

*Previous:*

A - Not designed as repeatable

H. Credit basis:

*Current:*

Letter graded only [X]

Pass/no pass [ ]

Student option [ ]

*Previous, if different:*

Letter graded only [ ]

Pass/no pass [ ]  
Student option [ ]

- I. Credit by exam:  
*Current:*  
Petitions may be granted: [ ]  
Petitions will not be granted: [X]
- Previous, if different:*  
Petitions may be granted: [ ]  
Petitions will not be granted: [ ]

III. Course Objectives:

Upon successful completion of this course, the student should be able to:

- A. Follow the rules of radiation safety for the protection of both patient and operator
- B. Explain the characteristics of radiation, physics, ionization, the electromagnetic spectrum, and the association of x-rays with matter
- C. Identify the components of x-ray beams
- D. Identify the components of the x-ray machine and their individual functions
- E. Describe the technical aspects of radiations production and the effects of adjusting the current voltage, and/or exposure time in the production of quality dental radiographs
- F. Identify the parts of the dental films packet and correctly manipulate it
- G. Use the different sizes and types of dental-x-ray film, and explain their individual uses
- H. Use the dark room facilities and automatic processors in the development of dental x-ray film
- I. Utilize different position indicating devices (PIDSs) when taking intraoral dental x-rays, using both of the paralleling techniques
- J. Identify and correct errors in film placement, using the rules of shadow casting and the inverse square law
- K. Manage the taking of diagnostic dental x-rays
- L. Identify anatomical landmarks, anomalies, restorations, caries, periapical lesions, and other possible pathological defects in a formal written critique of each full mouth survey of radiographs

IV. Student Learning Outcomes:

- A. List five factors that contribute to the diagnostic quality radiographs.
- B. Describe the process by which x-rays are produced.
- C. Describe the ionization process and explain its significance.
- D. Identify the components of the x-ray machine and their individual functions.

V. Course Content:

Topics to be covered include, but are not limited to:

- A. Introduction to history of radiology and radiation safety
  1. The progress of radiology from its discovery to the present
  2. The pioneers of radiography and identify their contributions
  3. The theories of biological damage and the possible effect of radiation on somatic and genetic cells
  4. The body cells in the order of their radio sensitivity

5. The factors that determine radiation injuries
  6. The sequence of events that may follow exposure to radiation
  7. The effects of oral radiation
  8. The terms used to measure radiation
  9. The various radiation monitoring devices
  10. The different areas of the x-rays area and their specific utilizations
  11. The duties of the Radiology Assistant
- B. The dental x-ray machine; the technical production of x-rays; bitewing x-rays
1. The types of x-ray machines and their major parts and components
  2. The functions of the electric circuits, the parts of the x-rays tube and control devices of x-ray machines
  3. The factors involved in x-ray generation.
  4. The constant potential and varying potential x-ray machines
  5. The basic requirements of an acceptable diagnostic radiograph
- C. Dental x-ray film, film processing, and asepsis in radiology
1. The difference between direct-exposure and indirect-exposure
  2. The parts and identification marks on dental x-ray film packets
  3. The various intra-oral films according to size, customary usage, and film speed
  4. Differentiate between intra-oral and extra-oral films
  5. The parts and intended use of the extra-oral cassette
  6. The correct methods of film handling and storage
  7. The sequence and the steps in processing radiographs
  8. The items of darkroom equipment, the compartments of processing equipment
  9. The major ingredients in processing solutions and explain the functions of each ingredient
  10. The three problem areas in quality control during processing
  11. The bitewing–taking x-rays in the mouth of clinic partners
  12. The exposure, mounting and critiquing of bitewings x-rays surveys on DXXTR
  13. The rules of asepsis
- D. Anatomical landmarks
1. The importance of recognizing and identifying normal anatomical landmarks of the face and head
  2. Recognizing and identifying the facial and cranial bones
  3. The anatomical landmarks of the maxilla and the mandible
  4. Differentiating between the terms radiopaque and radiolucent
  5. Differentiating, radiograph ally, between cortical and cancellous bone
  6. Recognizing and describing the radiographic appearance normally seen on radiographs of the maxillary arch and the mandibular arch
  7. Determining whether a periapical radiograph is of the right or left side
  8. Identifying periapical radiographs according to location in the maxilla or mandible and describing how to position it on a film mount.
- E. Intra-oral radiology
1. Identifying the three basic intraoral procedures
  2. Comparing the principles of the paralleling and bisecting technique
  3. Locating the points of entry on the face
  4. Differentiating between the methods used to obtain proper horizontal and vertical angulations
  5. Identifying the advance preparation required before radiographs are exposed
- F. Periapical radiology
1. Selecting the type and number of films required to make a complete periapical survey
  2. Identifying, assembling and positioning film holders (XCP) or snap-a-ray for the paralleling technique
  3. Differentiating between conventional periapical film placement and endodontic film placement
- G. Interpretation of dental radiographs

1. Differentiating between preliminary interpretation and diagnosis of the radiograph
  2. Identifying all radiopaque and radiolucent-appearing restorative materials
  3. Identifying the radiographic appearance of dental caries
  4. Describing the radiographic appearance of dental injuries
  5. Identifying two methods used to localize objects in the mouth by applying the buccal-object rule
  6. Placing, exposing, mounting and critiquing periapical x-rays taken with the snap-a-ray
- H. Identifying and correcting Faulty Radiographs
1. Identifying the types of radiographic errors caused by faulty exposure techniques
  2. Identifying the types of radiographic errors caused by incorrect film placement and angulation of the central ray
  3. Identifying the types of radiographic errors caused by faulty processing techniques
  4. Identifying the conditions that cause radiographic to be fogged
  5. Identifying the importance of quality control during chair-side film positioning
- I. Occlusal and extraoral radiology
1. Identifying the reasons for making an occlusal survey
  2. Comparing the topographical with the cross-sectional exposure method
  3. Positioning the film packet and establish horizontal and vertical angulation for maxillary and mandibular areas
  4. Identifying the types of film used in extraoral radiography
  5. Identifying three reasons for making extraoral exposures
  6. Identifying the types of surveys that can be performed extraorally
  7. Identifying and locating the listed cephalometric landmarks and planes on a cephalometric tracing
- J. Radiography for children and edentulous patients, and education of patients about radiography
1. Showing the importance of making radiographic examination on children
  2. Identifying the factors that determine when radiographs on children should be made and what type of film is best suited in each instance
  3. Differentiating the procedures involved in exposing radiographs on children and adults
  4. Explaining the importance for making the survey of edentulous areas
  5. Identifying the film requirements used for making an edentulous survey
  6. Explaining the necessity for patient education in radiology
  7. Describing several methods by which the patient can be educated to appreciate the value of dental radiology
  8. Identifying goals of the dental radiographer
  9. Placing, exposing, mounting and critiquing a full mouth series on a child and edentulous patient
- K. Panoramic radiology
1. Differentiating between a conventional a panoramic x-ray machine
  2. Identifying the main factor that determines the width of the focal trough
  3. Identifying the major factors that affect the geometry of the image
  4. Identifying in sequence the basic steps in operating a panoramic versus intraoral radiographic surveys
  5. Identifying five major head positioning errors that result in faulty panoramic radiographs

VI. Lab Content:

- A. Infection control protocols
- B. Radiation safety protocols

- C. Developing of exposed films
- D. Exposing BW films
- E. Exposing PA films
- F. Mounting films
- G. Determining diagnostic quality
- H. Documentation of radiographic findings
- I. Intro. to digital radiography

VII. Methods of Instruction:

Methods may include, but are not limited to:

- A. Class lectures provide factual information on specific topics like panoramic radiology
- B. Viewing visual sources, such as examples of proper x-ray beam placement and correctly taken full mouth x-rays, and using DXXTR to practice taking dental x-rays
- C. Small group demonstrations by faculty on the placement of radiographs, processing of radiographs, mounting of radiographs and interpretation of normal anatomical landmarks on the radiographs
- D. Small group demonstrations by faculty on universal precautions, and lab equipment and proper care of equipment

VIII. Methods of Evaluation and Assignments:

- A. Methods of evaluation for degree-applicable courses:

Essays [X]

Problem-solving assignments (Examples: Math-like problems, diagnosis & repair) [ ]

Physical skills demonstrations (Examples: Performing arts, equipment operation) [X]

For any course, if "Essays" above is not checked, explain why.

- B. Typical graded assignments (methods of evaluation):

1. Written radiographs critiques that evaluate radiographs taken by the student
2. Exams on topics like identifying anatomical landmarks in radiographs and consisting of:
  - a. Multiple choice
  - b. Matching items
  - c. True/false items
  - d. Essay questions
3. Student will be graded in the lab on their ability to expose, develop and mount radiographs. For example a student may be required to take 3 acceptable sets of full-mouth radiographs on DXXTR, four full-mouth set of radiographs on patients, and 3 set of bitewing films on DXXTR. These requirements will be graded with an evaluation form by the faculty member and the student will have a similar evaluation form on which they will self-assess.

- C. Typical outside of classroom assignments:

1. Reading
  - a. Student will spend a minimum of 4 hours per week outside of regular class time reading and reviewing assigned radiology topics, such as ALARA
2. Writing
  - a. Written self-evaluation of radiographs taken by the student
3. Other
  - a. Visual self-evaluation of radiographs taken by the student

IX. Textbooks and Instructional Materials:

A. Textbooks/Resources:

1. Johnson, O. and Thomson, E.M (2011). *Essentials of Dental Radiography for Dental Assistants and Hygienists* (9th/e). Prentice Hall.

B. Other instructional materials:

1. Dental radiographs
2. RIN kits and other positioning devices
3. DXTTR

X. Minimum Qualifications and Additional Certifications:

A. Minimum qualifications:

1. Dental Technology

B. Additional certifications:

1. Description of certification requirement:

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.

2. Name of statute, regulation, or licensing/certification organization requiring this certification:

Commission on Dental Accreditation

XI. Approval Dates

Curriculum Committee Approval Date: 11/23/2016

Board of Trustees Approval Date: 11/23/2016

State Approval Date: 06/13/2017

Catalog Start Date: Fall 2017

XII. Distance Learning Appendix

A. Methods of Instruction

Methods may include, but are not limited to:

B. Information Transfer

Methods may include, but are not limited to: