

**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 70 - Dental Radiography I

**UNIT VALUE:** 3

**MINIMUM NUMBER OF SEMESTER HOURS:** 80 hours

**BASIC SKILLS REQUIREMENTS:** Appropriate language skills

**ENTRANCE REQUIREMENTS:**

**PREREQUISITE:** Admission to the Dental Assisting Program

**COREQUISITE:** None

**RECOMMENDED PREPARATION:** None

**SCOPE OF COURSE:**

Theory and technique of oral radiography, radiation hygiene, anatomical landmarks, and methods and materials for processing radiographs. The laboratory portion will provide the student with knowledge concerning film placement, cone angulation, exposing and developing radiographs, and mounting and evaluating processed films. *Graded only.*

**SPECIFIC COURSE OBJECTIVES:**

The successful student will:

1. Demonstrate knowledge of radiation safety measures prior to exposing radiation.
2. Analyze and describe precautions necessary for both the patient and the dental assistant.
3. Explain the process of x-ray production and list the important properties of X-rays, and explain how they apply to clinical dentistry.
4. Identify dental x-ray tube and its component parts and list the functions of each part.
5. Explain the difference between filtration and collimation of the x-ray beam. What are the requirements of each?
6. Explain the influence of kilovoltage and milliamperage upon the resultant radiograph.
7. Determine the penetrating power of the x-rays and how it is controlled.
8. Explain the need for filtration of the x-ray beam.
9. Analyze the purpose of the lead foil in the film packet.
10. Describe the difference between a rad and a rem.
11. Describe the difference between a specific area and whole body.
12. Describe the major sources of secondary radiation.
13. List the body cells that are most sensitive to ionizing radiation.
14. Describe the long-term effects of radiation.

15. Explain the advantages/disadvantages of using fast film.
16. Identify and anticipate the problems associated with overexposure to radiation.
17. Describe the difference between a periapical and bite-wing film.
18. Analyze the criteria that determine whether a radiograph is diagnostic.
19. Explain the theory of the paralleling technique. Include the advantages and disadvantages.
20. Analyze what causes elongated and foreshortened images on radiographs and list corrective measures.
21. Discuss what causes overlapping of images on radiographs and list corrective measures.
22. Describe the indications for using extra oral and occlusal films in dentistry.
23. Describe the importance of the dental assistant's ability to address patient concerns regarding radiation hazards.
24. List the steps in the processing of dental x-ray film and discuss potential problems and their solutions.
25. Describe radiolucent and radiopaque and name an intraoral structure that exemplifies each.
26. Analyze what determines whether an object will be radiolucent or radiopaque.
27. Correctly obtain patient vitals for medical history records.
28. Anticipate how auxiliary error can lead to a deficient diagnosis.
29. Discuss controlling and influencing factors of MA and KVP on film diversity.
30. Discuss controlling and influencing factors of MA and KVP on film contrast.
31. Discuss protective attire and barrier techniques, hand washing, sterilization or disinfection of film holding instruments, and the cleaning and disinfection of the dental unit and environmental surfaces.
32. Discuss infection control procedures necessary prior to x-ray exposure.
33. Discuss infection control procedures during x-ray exposure.
34. Discuss infection control procedures following x-ray exposure.
35. Discuss infection control procedures necessary for film handling and processing.
36. Discuss various methods of waste disposal.
37. Give dental radiographs of any area of the oral cavity, identify the areas as to:
  - a. Arch
  - b. Posterior/anterior
  - c. Right/left
  - d. Specific teeth
  - e. Anatomical landmarks particular to specific area
  - f. Pathology (general) if any
  - g. Caries, restorations, bone level, etc.

### **CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:**

- I. Radiation Safety: Measures for students and patients includes radiography exposure policy and guidelines for radiography health safety and protection
- II. The Nature and Generation of X-rays
  - A. Electromagnetic radiations
  - B. Physical make-up of matter
  - C. The meaning of ion, ion pair, ionizing radiation, and ionization
  - D. Units and measurement of x-radiation
  - E. Classifying x-rays by their origin
  - F. Principles of x-ray generation
  - G. The x-ray generating system
- III. Biological Effects of Ionizing Radiation
  - A. The essence of body tissue reaction to x-rays
  - B. Some pertinent facts
  - C. The reluctant patient
- IV. Dental X-ray Film and Darkroom Processing

- A. The film
- B. The darkroom
- V. Anatomical Landmarks
  - A. Landmarks of the maxillary arch
  - B. Landmarks of the mandibular arch
- VI. The Bisection of the Angle Technique
  - A. The case of the equilateral triangle
  - B. Placement of film and tube head
  - C. Taking the radiograph
  - D. Care of the x-ray unit
- VII. Exposing Periapical Films of the Mandibular Arch
  - A. Central and lateral incisor exposure
  - B. Cuspid exposure
  - C. Bicuspid-molar exposure
  - D. Third molar exposure
  - E. Bite-block film holder
- VIII. Exposing Periapical Films of the Mandibular Arch
  - A. Central and lateral incisor exposure
  - B. Cuspid exposure
  - C. Bicuspid molar exposure
  - D. Third molar exposure
  - E. Bite-wing exposure
- IX. Bite-Wing Exposures
  - A. Bicuspid bite-wing exposure
  - B. Molar bite-wing exposure
  - C. Anterior bite-wing exposure
- X. The Long Cone, or Paralleling, Technique
  - A. Film placement
  - B. Extension cone paralleling (XCP) instruments
- XI. Review of Basic Principles
  - A. Bisection of the angle technique
  - B. Paralleling technique
- XII. Recognizing and solving problem situations
  - A. Bisection of the angle technique
  - B. Paralleling technique
- XIII. The Occlusal Technique
  - A. Anterior occlusal view of the maxillary arch
  - B. Anterior occlusal view of the mandibular arch
  - C. Cross-section occlusal view of the maxillary arch
  - D. Cross-section occlusal of the mandibular arch
- XIV. Extraoral Radiographs
  - A. Radiographs of the difficult third-molar impactions
  - B. Impacted third-molar exposure
  - C. Lateral jaw exposure
  - D. Panoramic x-ray units
- XV. The Child Patient
  - A. Periapical and bite-wing exposures
  - B. Lateral jaw exposures
  - C. Occlusal exposures
- XVI. The Endentulous Patient
- XVII. The Five Most Common Errors in Technique

XVIII. The Temporomandibular Joint

XVIX. Recognizing Other Imperfections

- A. Light image
- B. Dark image
- C. Blank or black film
- D. Processing film
- E. Errors in technique

XX. Making Use of the Radiograph

- A. Caries
- B. Acute and chronic periapical abscesses
- C. Periapical cysts
- D. Bone sclerosis (osteosclerosis, condensing osteitis)
- E. Periodontal disease
- F. Resorption of tooth structure
- G. Root tips retained in alveolar bone
- H. Root fracture
- I. Supernumerary teeth

XXI. Anatomical Landmarks Versus Pathological Lesions

- A. Incisive canal foramen
- B. Mental foramen
- C. Maxillary sinus
- D. Submaxillary gland fossa
- E. Coronoid process
- F. Cementoma
- G. Radiolucent areas of teeth

XXII. Infection Control

- A. Universal precautions
- B. Sterilization and disinfection of film holding instruments
- C. Barrier protocol for radiography equipment
- D. Infection control procedures for film handling and processing

XXIII. Vital signs

- A. Blood pressure
- B. Pulse
- C. Temperature
- D. Emergency medical situations

### **REQUIRED READING:**

Johnson, Orlen N., Wolf R. De Lyre, Michael A. Mc Nally, and Christine E. Essay. Essentials of Dental Radiography for Dental Assistants and Hygienists. 7<sup>th</sup> Ed. New Jersey: Prentice Hall, 2003.

### **SUGGESTED READING:**

Haring, Joen and Laura Jansen. Dental Radiography Principles and Techniques. 2<sup>nd</sup> Ed. Philadelphia: S.B. Saunders, 1996.

### **REQUIRED WRITING:**

Assignments, 1 to 5 pages in length, covering all areas to demonstrate proficiency and knowledge of all aspects of x-ray exposure, processing and mounting, including the risk factors and safety measures involved. Guidelines followed in this class are set forth by the State Board of Dental Examiners and the American Dental Association.

## 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.

Outside assignments include:

Reading assignments from required text.

## INSTRUCTIONAL METHODOLOGY:

Check all that apply:

- lecture  
 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 radiography 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 laboratory 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  
59-50% = F

Each student must complete the laboratory requirements with 75% proficiency PRIOR to taking the written and (clinical) practical finals.

Written exams	35%
Written assignments	10%
Lab Radiographs	15% (must have 75% proficiency)
Clinical Final	<u>40%</u>
	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, Ext. 2573**

**SIGNATURES ON FILE:**