



# **ILLINOIS VALLEY COMMUNITY COLLEGE**

## **COURSE OUTLINE**

**DIVISION: Workforce Development**

**COURSE: DLA 2204 Dental Radiography II**

Date: Spring 2020

Credit Hours: 2

Prerequisite(s): DLA 1204 with a grade of C or better

Delivery Method:

<input checked="" type="checkbox"/> Lecture	1 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Seminar	0 Contact Hours (1 contact = 1 credit hour)
<input checked="" type="checkbox"/> Lab	2 Contact Hours (2-3 contact = 1 credit hour)
<input type="checkbox"/> Clinical	0 Contact Hours (3 contact = 1 credit hour)
<input type="checkbox"/> Online	
<input type="checkbox"/> Blended	

Offered:  Fall  Spring  Summer

IAI Equivalent –**Only for Transfer Courses**-go to <http://www.itransfer.org>:

### **CATALOG DESCRIPTION:**

This course continues intensified practice in exposure, processing and mounting of dental radiographs. Students will also be introduced to interpretation of radiographs and specialized intraoral and extraoral radiographic techniques.

## GENERAL EDUCATION GOALS ADDRESSED

*[See last page for Course Competency/Assessment Methods Matrix.]*

### Upon completion of the course, the student will be able:

*[Choose up to three goals that will be formally assessed in this course.]*

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciation for diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

### EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

*[Outcomes related to course specific goals. See last page for more information.]*

#### Upon completion of the course, the student will be able to:

1. Demonstrate basic understanding of patient education related to radiographic procedures.
  - 1.1. Explain the necessity for patient education in radiography.
  - 1.2. Identify the benefits that the patient derives from preventive radiation procedures.
  - 1.3. Describe several methods by which the patient can be educated to appreciate the value of dental radiography.
  - 1.4. Identify the goals of a dental radiographer.
2. Demonstrate a basic understanding of patient management during radiographic procedures.
  - 2.1. Describe how to manage patients with special problems.
  - 2.2. Discuss how the operator's appearance and attitude may affect the patient's cooperation.
  - 2.3. Explain how to handle common problems with film placement caused by anatomical variations in the mouth.
3. Demonstrate a basic understanding of radiographic patient selection criteria.
  - 3.1. Discuss and follow the guidelines for prescribing dental radiographs for the new patient, either child, adolescent or adult.
  - 3.2. Discuss and follow the guidelines for prescribing dental radiographs for the recall patient, either child, adolescent or adult.
4. Demonstrate a basic understanding of dental film
  - 4.1. Discuss the composition of dental x-ray films
  - 4.2. Identify and compare the various intraoral films according to size, customary usage, and film speed
  - 4.3. Differentiate between direct and indirect exposure films, as well as intraoral and extra oral films
  - 4.4. Identify reasons for film duplication
  - 4.5. Identify proper film storage and protection.
5. Demonstrate a basic understanding of dental film processing

- 5.1. Identify and list the major ingredients in processing solutions and explain the functions of each ingredient
- 5.2. Discuss the concept of a latent image and how it becomes visible
- 5.3. Identify, in sequence, the steps in processing radiographs.
- 5.4. Discuss items of darkroom equipment, the compartments of processing tanks, and the types of safelights
- 5.5. Differentiate among manual, rapid, and automatic processing
6. Demonstrate a basic understanding of preliminary interpretation of radiographs by auxiliary personnel.
  - 6.1. Differentiate between preliminary interpretation and diagnosis of the radiograph.
  - 6.2. Identify all radiopaque- and radiolucent-appearing restorative materials and cements.
  - 6.3. Identify the radiographic appearance of dental caries.
  - 6.4. Identify at least four types of cysts.
  - 6.5. Identify all radiopaque- and radiolucent-appearing prosthetic appliances.
  - 6.6. Identify the radiographic appearance of periodontal disease.
7. Demonstrate a basic understanding of special radiographic techniques such as edentulous, pediatric, and extraoral.
  - 7.1. Discuss the importance of making radiographic examinations on children.
  - 7.2. Identify the factors that determine when radiographs on children should be made and what type and receptor size is best suited in each instance.
  - 7.3. Differentiate the procedures involved on exposing radiographs on children and adults.
  - 7.4. Explain the importance of making a radiographic survey of edentulous areas.
  - 7.5. Identify the film requirements for an edentulous survey.
  - 7.6. Differentiate the procedures used for making the survey in a fully or a partially edentulous patient.
  - 7.7. Identify three reasons for making extraoral exposures.
  - 7.8. Identify the types of surveys and films used in extraoral radiography.
  - 7.9. Differentiate between a conventional and a panoramic x-ray machine.
  - 7.10. Discuss the concept of a focal trough.
  - 7.11. Identify, in sequence, the basic steps in operating a panoramic x-ray unit.
  - 7.12. Identify five major head-positioning errors that result in faulty panoramic radiographs.
  - 7.13. Compare the advantages and disadvantages of panoramic versus intraoral radiographic surveys.
  - 7.14. Describe the fundamentals of three-dimensional imaging
  - 7.15. Identify normal anatomy on a panoramic image.
8. Explain the legal responsibilities of the Dental Assistant
  - 8.1. Compare and contrast the procedure and information that is involved in diagnosis versus interpretation/evaluation of a radiograph
  - 8.2. Indicate who may diagnose from a radiograph
  - 8.3. List the type interpretations made from a radiograph and importance of interpretations.
  - 8.4. List the type of diagnoses made from a radiograph and importance of these diagnoses.
  - 8.5. Demonstrate the proper completion of dental records when taking radiographs
  - 8.6. Explain the life cycle of radiographic records and their care and ownership
9. Demonstrate a basic understanding of quality assurance in the dental office
  - 9.1. Discuss purpose and frequency of testing dental x-ray machines
  - 9.2. Discuss quality control tests needed for digital imaging procedures
  - 9.3. Identify the importance of operator competence in dental radiographic procedures

## MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

[For each of the goals selected above, indicate which outcomes align with the goal.]

Goals	Outcomes
First Goal	
To apply analytical and problem-solving skills to personal, social and professional issues and situations.	8.1, 8.4, 8.5, 8.6 8.1 Compare and contrast the procedure and information that is involved in diagnosis verses interpretation/evaluation of a radiograph 8.4 List the type of diagnoses made from a radiograph and importance of these diagnoses. 8.5 Demonstrate the proper completion of dental records when taking radiographs 8.6 Explain the life cycle of radiographic records and their care and ownership
Second Goal	
To communicate successfully, both orally and in writing, to a variety of audiences.	1.1, 1.2, 8.5 1.1 Explain the necessity for patient education in radiography. 1.2 Identify the benefits that the patient derives from preventive radiation procedures. 8.5 Demonstrate the proper completion of dental records when taking radiographs
Third Goal	
To recognize what it means to act ethically and responsibly as an individual and as a member of society.	8.2, 8.3, 8.6 8.2 Indicate who may diagnose from a radiograph 8.3 List the type interpretations made from a radiograph and importance of interpretations 8.6 Explain the life cycle of radiographic records and their care and ownership

### COURSE TOPICS AND CONTENT REQUIREMENTS:

- I. Patient Education in Radiographic Procedures
  - A. Necessity
  - B. Benefits of preventative radiography
  - C. Methods of patient education
    - i. Oral presentation
    - ii. Video
    - iii. Printed literature
  - D. Goals of radiographer
    - i. Professional Improvement
    - ii. Defined professional goals
    - iii. Be committed to achieving those said goals
- II. Patient Management
  - A. Special problems
    - i. Patients with gag reflex
    - ii. Patients with disabilities

- iii. Pediatric patients
    - iv. Endodontic patients
    - v. Edentulous patients
  - B. Operators appearance
  - C. Operators attitude
  - D. Patient cooperation
  - E. Film placement
    - i. Anatomical variations
- III. Patient selection criteria
  - A. Guidelines for prescribing
    - i. New patient
    - ii. Adult
    - iii. Adolescent
    - iv. Child
- IV. Dental Film
  - A. Composition
  - B. Intraoral Film
    - i. Size
    - ii. Customary Usage
    - iii. Film Speed
  - C. Direct Exposure Films
  - D. Indirect Exposure Films
  - E. Intraoral Films
  - F. Extraoral Films
  - G. Film Duplicating
    - i. Referrals
    - ii. Insurance claims
    - iii. Teaching aids
  - H. Film Storage
    - i. Cool, dry place
    - ii. Low humidity
    - iii. Shielded from radiation sources
    - iv. Expiration Date
- V. Film processing
  - A. Developer
    - i. Hydroquinone
    - ii. Elon
    - iii. Sodium sulfite
    - iv. Sodium carbonate
    - v. Potassium bromide
  - B. Fixer
    - i. Sodium thiosulfate/ammonium thiosulfate
    - ii. Sodium sulfite
    - iii. Potassium alum
    - iv. Acetic acid/sulfuric acid
  - C. Latent Image and Visibility
  - D. Processing Steps
    - i. Developer
    - ii. Fixer
    - iii. Water

- iv. Drying Chamber
- E. Darkroom Equipment
- F. Compartments of processing tanks
- G. Safelights
- H. Processing
  - i. Manual
  - ii. Rapid
  - iii. Automatic
- VI. Interpretation of radiographs
  - A. Interpretation vs diagnosis
  - B. Identification
    - i. Radiopaque
    - ii. Radiolucent
    - iii. Restorative materials and cements
    - iv. Dental caries
  - C. Identification of Cysts
    - i. Periapical
    - ii. Periodontal
    - iii. Dentigerous
    - iv. Residual
  - D. Prosthetic devices
    - i. Radiolucent
    - ii. Radiopaque
  - E. Periodontal Disease
    - i. Description
    - ii. Detection
    - iii. Interpretation
- VII. Special Radiographic Techniques
  - A. Edentulous
    - i. Importance
    - ii. Film requirements
  - B. Pediatric
    - i. Importance
    - ii. Factors
    - iii. Types
    - iv. Size
    - v. Procedure
  - C. Extraoral
    - i. Evaluate large areas of the skull and jaw
    - ii. Evaluate growth and development
    - iii. Detect disease
    - iv. Types
      - 1. Panoramic
      - 2. Cephalometric
      - 3. Lateral Jaw
  - D. Focal Trough
  - E. Operation of Panoramic Unit
  - F. Head Positioning Errors in Panoramic radiographs
    - i. Lips and tongue
    - ii. Chin tipped up

- iii. Chin tipped down
    - iv. Teeth anterior to focal trough
    - v. Teeth posterior to focal trough
    - vi. Head turned
    - vii. Slumped posture
  - G. Panoramic vs. Intraoral
    - i. Advantages
    - ii. Disadvantages
  - H. Three-Dimensional Imaging
- VIII. Legal Responsibilities
  - A. Diagnosis vs. interpretation/evaluation
  - B. Diagnosing
    - i. Responsibility
    - ii. importance
  - C. Interpretations
    - i. Importance
  - D. Dental Records
  - E. Life Cycle of Radiographic Records
    - i. Care
    - ii. Ownership
- IX. Quality Assurance
  - A. Testing
    - i. Equipment
    - ii. Supplies
    - iii. Film Processing
    - iv. Digital Imaging
  - B. Quality Administration
  - C. Operator Competence

**INSTRUCTIONAL METHODS:**

- Lecture
- Class discussion
- Demonstration
- Visual aids - videos, slides, models
- Website reviews
- Exams and quizzes
- Laboratory practice of skills
- Laboratory practical exams
- Clinical exposures on patients
- Problem solving exercises
- Role playing - patient education

**INSTRUCTIONAL MATERIALS:**

**Textbook:** *Dental Radiography Principles and Techniques*, Fifth Edition, Iannucci/Howerton, Elsevier, 2017.

**Laboratory Manual:** Dental Radiography I & II : Policy and Procedure Manual, Chemical and Equipment Information Workbook, 2019-2020, H. Seghi/K. Henkel

**STUDENT REQUIREMENTS AND METHODS OF EVALUATION:**

**Lecture:** Reading assigned materials, note taking, and participation in classroom discussion is expected of students, as is timely completion of homework assignments. Written examinations, written papers, power points projects, and presentations may all be used to evaluate student progress.

The lecture grade will be calculated as follows:

Attendance: 3%

Homework: 12%

Critical Thinking Questions: 15%

Exams: 35%

Final Exam 35%

**Laboratory:** Quizzes, practice exercises, written exercises, roll play and radiographs are used to evaluate student progress. The grading scale above will be used for quizzes, practice exercises, written exercises and roll play.

The laboratory grade will be calculated as follows:

Radiographs: 75%

Quizzes/Assessments: 25%

A minimum grade of "C", in both lecture and laboratory sections is required to successfully complete this course. The final grade is calculated: 50% lecture grade and 50% laboratory grade.

A= 90-100

B= 80-89

C= 70-79

D= 60-69

F= 0-59

**OTHER REFERENCES:**



# Course Competency/Assessment Methods Matrix

(Dept/# Course Name)	Assessment Options																																	
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment		
	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D								
Demonstrate basic understanding of patient education related to radiographic procedures.				X	X	X		X	X	X		X	X		X			X		X								X	X	X			X	X
Demonstrate a basic understanding of patient management during radiographic procedures.				X	X			X	X	X		X	X		X			X		X								X	X	X			X	X
Demonstrate a basic understanding of radiographic patient selection criteria.				X	X			X	X	X		X	X		X			X		X								X	X	X			X	X
Demonstrate a basic understanding of the anatomical landmarks that are seen on dental radiographs.				X	X			X	X	X		X	X		X			X		X								X	X	X			X	X
Demonstrate a basic understanding of preliminary interpretation of radiographs by auxiliary personnel.				X	X			X	X	X		X	X		X			X		X								X	X	X			X	X

