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:  
- Lecture 1 Contact Hours (1 contact = 1 credit hour)
- Lab 2 Contact Hours (2-3 contact = 1 credit hour)
- Online 0 Contact Hours (3 contact = 1 credit hour)

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 in 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.
   7.15. 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.]

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

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 thanks
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 devises
      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:

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

#### Assessment Options

For each competency/outcome place an “X” below the method of assessment to be used.

<table>
<thead>
<tr>
<th>Direct/Indirect</th>
<th>Assessment of Student Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assessment Options</td>
</tr>
<tr>
<td>Indirect</td>
<td></td>
</tr>
</tbody>
</table>

#### Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.

- **Demonstrate basic understanding of patient education related to radiographic procedures.**
  - 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

- **Demonstrate a basic understanding of radiographic patient selection criteria.**
  - 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

- **Demonstrate a basic understanding of preliminary interpretation of radiographs by auxiliary personnel.**
  - X X X X X X X X X X X X
<table>
<thead>
<tr>
<th>Demonstrate a basic understanding of special radiographic techniques such as occlusal, edentulous, pediatric, and extraoral.</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain the legal responsibilities of the Dental Assistant.</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>