

**Maui Community College
Course Outline**

1. Alpha DENT Number 176
Course Title Dental Radiology I
Credits 2
Department Allied Health Author
Date of Outline 2/5/09 Effective Date Fall 2009 5-year Review Date Fall 2014

2. Course Description: Provides the fundamental background and theory for the safe and effective use of radiation as it relates to dentistry. Discusses the history of x-rays, production and uses of radiation, radiographic film, exposure factors, interpretation of radiographs, radiation hygiene, anatomic landmarks, developmental disturbances, and legal considerations. Provides clinical experience in the use of x-ray units, various exposure projections and techniques, processing, mounting, and critiquing dental radiographs.

Cross-list

Contact Hours/Type Lecture - one (1), Lab - three (3)

3. Pre-requisites Admission to Dental Assisting Program

Pre-requisite may be waived by consent yes no

Co-requisites

Recommended Preparation

4. Function/Designation AA Category Additional Category

AS Allied Health - Dental Hygiene Category List Additional Programs and Category:

AAS Program Category List Additional Programs and Category:

BAS Program Category Developmental/Remedial

Chancellor

Approval Date

Other/Additional: Explain:

See Curriculum Action Request (CAR) form for the college-wide general education and/or program SLOS this course supports.

- This course outline is standardized and/or the result of a community college or system-wide agreement.
Responsible committee:
5. Student Learning Outcomes (SLOs): List one to four inclusive SLOs.
For assessment, link these to #7. Recommended Course Content, and #9. Recommended Course Requirements & Evaluation. Use roman numerals (I., II. III.) to designate SLOs
On successful completion of this course, students will be able to:
- I. Obtain full mouth, panoramic, bitewing, and occlusal surveys with diagnostically usable film.
 - II. Practice proper infection control, OSHA, and biohazard practices while exposing and processing radiographs.
 - III. Describe the process by which x-rays are produced, identifying the physical and electrical factors which alter the density or penetrability of the x-rays produced.
 - IV. Identify radiographic landmarks, exposure errors, and processing errors.
6. Competencies/Concepts/Issues/Skills
For assessment, link these to #7. Recommended Course Content, and #9. Recommended Course Requirements & Evaluation. Use lower case letters (a., b., c...n.)to designate competencies/skills/issues
On successful completion of this course, students will be able to:
- a. Describe the history of x-radiation.
 - b. Describe the production, characteristics, and biological effects of radiation.
 - c. Explain the function, components, operation of the x-ray unit, and its proper care and maintenance.
 - d. Demonstrate proper infection control in the darkroom and while exposing films, film developing (automatic and manual processing), duplicating, and maintenance of developer.
 - e. Define radiographic terms.
 - f. Identify the component parts of the x-ray units and explain the adjustments, which can be made to affect the quality of the radiograph.
 - g. Demonstrate proper evaluation of patient charts prior to radiographic procedures. Update and evaluate medical history, evaluate dental radiographic history, and check treatment plan of radiographs to be taken.
 - h. Define the terms used to indicate the degree of radiation production or exposure and indicate, where applicable, the allowable, dangerous, or lethal limits for each.
 - i. Describe an understanding of the principles of tomography and how they apply to dental panoramic x-ray units.
 - j. Discuss the indications for extraoral projections and apply them to clinical practice.
 - k. Demonstrate the use of protective equipment.
 - l. Demonstrate exposure of and evaluation of a panoramic radiograph.
 - m. Demonstrate the development of exposed radiographs to a consistent density standard while performing all darkroom procedures in a clean, safe, and organized manner.
 - n. Describe radiation protection and monitoring, listing the protective measures that can or must be taken to minimize radiation exposure for the patient and operator.
 - o. Demonstrate the proper placement of x-ray films in their mounts.
 - p. Describe the accepted infection control policy in taking and processing all radiographs.
 - q. Demonstrate the assembly of film holders.

- r. Identify anatomic landmarks and radiographic radiopaque and radiolucent landmarks of the maxilla and the mandible.
- s. Demonstrate intraoral long-cone radiographic techniques in the bitewing, periapical (paralleling and bisecting angle techniques), and occlusal surveys on a manikin.
- t. Demonstrate intraoral technique: paralleling and bisecting angle techniques.
- u. Describe image receptors and film sizes.
- v. Discuss chemistry and techniques associated with x-ray film and developing solutions.

7. Suggested Course Content and Approximate Time Spent on Each Topic

Linked to #5. Student Learning Outcomes and # 6 Competencies/Skills/Issues

- 1 week History, characteristics, and production of radiation (I, III, a, b, e, h, k, n)
- 1 week The x-ray unit, its components and adjustments (I, II, III, c, d, e, f, i, l, n)
- 5 weeks Principles of film placement and beam angulation in various dental radiographic projections (I, II, III, IV, d, e, f, i, j, k, l, n, q, r, s, t, u)
- 2 weeks Biologic effects of radiation and protective measures to minimize radiation exposure (I, III, a, b, c, e, g, h, j, k, l, n, s, t, u)
- 1 week Dark room equipment, processing, and duplicating techniques (I, II, IV, d, e, k, m, p, v)
- 2 weeks Radiographic landmarks of the skull (I, III, IV, e, i, j, l, o, r, s, t)
- 3 weeks Prescription procedure, radiographic records, film mounting, and film evaluation for diagnostic utility (I, III, IV, e, g, j, l, o, r, s, t)

8. Text and Materials, Reference Materials, and Auxiliary Materials

Appropriate text(s) and materials will be chosen at the time the course is offered from those currently available in the field. Examples include: Howerton, L. and Iannucci, J., *Dental Radiography: Principles and Techniques*, current edition, Elsevier.

Bird, D. and Robinson, D., Torres and Ehrlich *Modern Dental Assisting*, current edition, Elsevier.

Bird, D. and Robinson, D., *Student Workbook to Accompany Torres and Ehrlich Modern Dental Assisting*, current edition, Elsevier.

Appropriate reference materials will be chosen at the time the course is offered from those currently available in the field. Examples include: Johnson, O. and Thomson, E., *Essentials of Dental Radiography for Dental Assistants and Hygienists*, current edition, Prentice Hall.

Massler, M. and Schour, I., *Atlas of the Mouth*, current edition, American Dental Association.

Thomson, E., *Exercises in Oral Radiography Techniques: A Laboratory Manual*, current edition, Prentice Hall.

Durley, C. et al., *The DANB Review*, current edition, Dental Assisting National Board.

Durley, C. et al., *DANB's Glossary of Dental Assisting Terms*, current edition, Dental Assisting National Board.

Mosby et al., *Mosby's Dental Dictionary*, current edition, Elsevier.

Mosby et al., Review Questions and Answers for Dental Assisting, current edition, Elsevier.

Appropriate auxiliary materials will be chosen at the time the course is offered from those currently available in the field. Examples include: State of Hawaii Department of Commerce and Consumer Affairs, Hawaii Administrative Rules Title 16, Chapter 79, Dentists and Dental Hygienists.

State of Hawaii Department of Commerce and Consumer Affairs, Hawaii Revised Statutes Chapter 448, Dentistry.

9. Suggested Course Requirements and Evaluation

Linked to #5. Student Learning Outcomes (SLOs) and #6 Competencies/Skills/Issues

Specific course requirements are at the discretion of the instructor at the time the course is being offered. Suggested requirements might include, but are not limited to:

- Prompt attendance is required at all class sessions. (I, II, III, IV, a - v)
- Students will be responsible for completing all assigned reading material in text before each class session. (I, II, III, IV, a - v)
- Complete various learning skills exercises. (I, II, III, IV, a, b, c, e, h, i, j, n, p, r, u, v)
- Complete various competency exercises. (I, II, III, IV, c, d, k, l, m, p, q, s, t)
- Complete various laboratory exercises. (I, II, III, IV, c, d, f, g, j, k, l, m, o, p, q, r, s, t, u, v)
- Complete all projects. (I, II, III, IV, a - v)

EVALUATION AND GRADING

Quizzes	10% (III, IV, a, b, c, e, f, h, i, j, n, p, r, u, v)
Final	20% (III, IV, a, b, c, e, f, h, i, j, n, p, r, u, v)
Radiographic mounting project	15% (IV, o, r)
Lab practicals	25% (I, II, III, IV, c, d, f, g, j, k, l, m, n, o, p, q, r, s, t, u, v)
Evaluation of films	20% (I, II, III, IV, e, l, o, r)
Attendance/ Attitude	10% (I, II, III, IV, a - v)

10. Methods of Instruction

Instructional methods will vary considerably by instructor. Specific methods are at the discretion of the instructor teaching the course and might include, but are not limited to:

- Participation in class lecture/ discussion.
- Reading assigned portions in textbooks, journal articles, and/ or modules.
- Viewing various audiovisual materials.
- Participation in class exercises such as role-plays and simulations.
- Demonstration and simulation.
- Practicing exposure on manikins.
- Practicing positioning on student partners.
- Discovery learning.

11. Assessment of Intended Student Learning Outcomes Standards Grid attached