

**University of Hawaii Maui College**  
**DH 267 - Radiology & Interpretation**

**1. Course Alpha.**

DH

**2. Course Number.**

267

**3. Course Title/Catalog Title.**

Radiology & Interpretation

**4. Number of Credits.**

3

**5. Contact Hours/Type.**

- Hour lab (6)
- Hour lecture (1)

**6. Course Description.**

Reviews the production, characteristics, and biological effects of radiation, functions, components, and operation of the x-ray unit. Includes radiation protection and monitoring, chemistry and techniques associated with x-ray film and developing solutions. Reviews anatomic landmarks, intraoral, short-cone radiographic techniques in bitewing, periapical, full mouth and occlusal surveys. Introduces and expands experience of radiographic identification, interpretation of radiographic caries, periodontal disease, endodontics, edentulous, trauma, and dental anomalies utilizing dental x-ray films, panoramic, cephalometric and other extraoral radiographs. Explains forensic and legal considerations of dental radiology. Reviews traditional methods of x-ray exposure including digital technique. Includes clinical lab experience of exposing and interpreting radiographs on clients.

**7. Pre-Requisites.**

Pre-req: Admission to Dental Hygiene Program.

**8. Co-requisites.**

DH 158

**9. Recommended Preparation.**

None

**10. Is this a cross-listed course?**

NO

**11. Reason for Proposal. Why is this course being proposed or modified? This question requires specific information as part of the explanation.**

Due to the proposed change in DA pre-requisite, a modification of the radiology course in DH was necessary. The faculty/lecturers have determined that one radiology course is sufficient to cover all required

course content by increasing the course to 3 credits from two separate radiology courses totally 2 credits. Evaluation of radiographic technique continues throughout the two year curriculum.

**12. Effective Semester and Year.**

Spring 2016

**13. Grading Method. What grading methods may be used for this course?**

- Letter grade only/No Audit (0)

**14. Is this course repeatable for credit? How often can this course be counted toward a degree or certificate?**

NO

**15. Course Student Learning Outcomes (SLOs).**

Course SLO/Competency	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	A	A	A	
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	A	A	A	
Discuss historic contributions associated with the discovery and growth of x-radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																												
Adhere to state and federal laws, recommendations and regulations in the provision of dental hygiene care				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																							
Perform a comprehensive examination using clinical, radiographic, periodontal, dental charting and other data collection procedures to assess the patients needs.										<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
Obtain diagnostic quality radiographs																							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**LEGEND**

- A. Recognize the components of the x-ray machine, their functions, and their controlling factors
- B. Understand the characteristics of dentally used radiation and how these affect radiographic image production
- C. Obtain a working knowledge of Radiation Biology to understand the harmful effects of ionizing radiation on human tissues
- D. Explain the relationship between quality assurance and quality control
- E. List the four objectives of quality control tests
- F. Identify agencies responsible for regulations regarding safe handling of hazardous radiographic products
- G. List the requirements of the OSHA Hazard Communication Standard
- H. Identify radiographic wastes that are considered hazardous to personnel and harmful to the environment
- I. Summarize the steps used to produce diagnostically useful images
- J. Discuss the importance of communication in the operator-patient relationship
- K. Practice all principles of radiation safety applicable to actual exposure of radiographs
- L. Recognize and produce radiographic exposures which meet identified criteria
- M. Evaluate the exposed radiographs to determine that they meet the identified criteria
- N. Describe methods to improve or modify the procedure or final product if the identified criteria are not met
- O. Recall radiographic manifestations of pathologic conditions of jaws including most common benign neoplasms and malignancies
- P. Employ a systematic approach in radiographic interpretation

- Q. Identify dental caries on a radiograph
- R. Distinguish the radiographic features of periodontal disease
- S. Describe radiographic and clinical signs and symptoms of infections of periapical tissues
- T. List common dental anomalies and their distinctive clinical and radiographic features
- U. Recognize radiographic features of regressive changes in the dentition
- V. State radiographic aspects of common traumas to the teeth and facial structures and recall methods of management of the traumas
- W. Determine the appropriate radiographic exposure according to the needs of the operator and the characteristics of the patient
- X. Accept responsibility for decisions regarding need for exposure, interpretation and utilization of radiographs
- Y. Identify errors on actual radiographs
- Z. Describe methods to prevent errors
- AA. Perform clinical examination prior to exposing any radiographs.
- BB. Adhere to accepted guidelines for prescribing radiographs.
- CC. Review all available radiographs of each patient for interpretation of presence or absence of disease.
- DD. Record radiographic findings in the patient record

Course SLO/PSLO	Demonstrate their cumulative knowledge and skill by successfully passing both written and clinical dental hygiene examinations.	Provide comprehensive dental hygiene care to promote patient health and wellness using critical thinking and problem solving in the provision of evidence-based practice	Provide accurate, consistent, and complete documentation for assessment, and evaluation of dental hygiene services.
Discuss historic contributions associated with the discovery and growth of x-radiation	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Adhere to state and federal laws, recommendations and regulations in the provision of dental hygiene care	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Perform a comprehensive examination using clinical, radiographic, periodontal, dental charting and other data collection procedures to assess the patients needs.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Obtain diagnostic quality radiographs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

## 16. Course Competencies.

Competency
Recognize the components of the x-ray machine, their functions, and their controlling factors
Understand the characteristics of dentally used radiation and how these affect radiographic image production
Obtain a working knowledge of Radiation Biology to understand the harmful effects of ionizing radiation on human tissues
Explain the relationship between quality assurance and quality control
List the four objectives of quality control tests
Identify agencies responsible for regulations regarding safe handling of hazardous radiographic products
List the requirements of the OSHA Hazard Communication Standard
Identify radiographic wastes that are considered hazardous to personnel and harmful to the environment
Summarize the steps used to produce diagnostically useful images
Discuss the importance of communication in the operator-patient relationship
Practice all principles of radiation safety applicable to actual exposure of radiographs
Recognize and produce radiographic exposures which meet identified criteria
Evaluate the exposed radiographs to determine that they meet the identified criteria
Describe methods to improve or modify the procedure or final product if the identified criteria are not met
Recall radiographic manifestations of pathologic conditions of jaws including most common benign neoplasms and malignancies
Employ a systematic approach in radiographic interpretation
Identify dental caries on a radiograph
Distinguish the radiographic features of periodontal disease
Describe radiographic and clinical signs and symptoms of infections of periapical tissues
List common dental anomalies and their distinctive clinical and radiographic features
Recognize radiographic features of regressive changes in the dentition
State radiographic aspects of common traumas to the teeth and facial structures and recall methods of management of the traumas

Determine the appropriate radiographic exposure according to the needs of the operator and the characteristics of the patient
Accept responsibility for decisions regarding need for exposure, interpretation and utilization of radiographs
Identify errors on actual radiographs
Describe methods to prevent errors
Perform clinical examination prior to exposing any radiographs.
Adhere to accepted guidelines for prescribing radiographs.
Review all available radiographs of each patient for interpretation of presence or absence of disease.
Record radiographic findings in the patient record

**17. Recommended Course Content and Timeline. The course content facilitates the course competencies. Course content may be organized by weeks, units, topics or the like.**

Content
Week 1 Introduction to Course, Radiation History Ch. 1 Characteristics & Measurement of Radiation Ch. 2 Dental X-ray Machine Ch. 3
Week 2-3 Production of Quality Radiographs Ch. 4 Effects of Radiation Exposure Ch. 5 Radiation Protection Ch. 6
Week 4 Radiographic Film and Its Properties Ch. 7 Processing Radiographic Film Ch. 8
Week 5 Intraoral procedures Ch. 13 Bitewing Examination/ Occlusal Exam Ch. 16, 17
Week 6-7 Paralleling Ch. 14 Bisecting Ch. 15
Week 8 Infection Control/ Mounting and Viewing Ch. 10 & 21
Week 9 Identifying and Correcting Undiagnostic Radiographs Ch. 18 Quality Assurance Ch. 19
Week 10-11 Environmental Responsibility Ch. 20 Recognizing Normal Radiographic Anatomy Ch. 22 Recognizing Deviations (Anomalies/trauma) Ch. 23
Week 12 Detection of Caries Ch. 24 Evaluation of Periodontal Disease Ch. 25
Week 13 Digital Radiography Ch.9 Panoramic Radiography Ch. 30 Extra-oral Imaging and Alternate modalities Ch. 29
Week 14 Radiographic Techniques for Children Ch. 26 Managing Patients with Special Needs Ch. 27 Supplemental Radiographic Techniques Ch. 28
Week 15-16 Legal and Ethical Responsibilities Ch. 11 Patient Relations and Education Ch. 12

**18. Program Learning Outcomes.**

Program SLO
Demonstrate their cumulative knowledge and skill by successfully passing both written and clinical dental hygiene examinations.
Provide comprehensive dental hygiene care to promote patient health and wellness using critical thinking and problem solving in the provision of evidence-based practice.
Provide accurate, consistent, and complete documentation for assessment, and evaluation of dental hygiene services.

**19. College-wide Academic Student Learning Outcomes (CASLOs).**

<b>Creativity</b> - Able to express originality through a variety of forms.
<b>Critical Thinking</b> - Apply critical thinking skills to effectively address the challenges and solve problems.
<input checked="" type="checkbox"/> <b>Information Retrieval and Technology</b> - Access, evaluate, and utilize information effectively, ethically, and responsibly. <input checked="" type="checkbox"/> Preparatory Level
<input checked="" type="checkbox"/> <b>Oral Communication</b> - Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes. <input checked="" type="checkbox"/> Level 1
<b>Quantitative Reasoning</b> - Synthesize and articulate information using appropriate mathematical methods to solve problems of quantitative reasoning accurately and appropriately.
<b>Written Communication</b> - Write effectively to convey ideas that meet the needs of specific audiences and purposes.

20. Linking. CLICK ON CHAIN LINK ICON IN UPPER RIGHT HAND CORNER TO BEGIN LINKING.

21. Method(s) of delivery appropriate for this course.

- Classroom/Lab (0)

22. Text and Materials, Reference Materials, and Auxiliary Materials.

- Thomson & Johnson. Essentials of Dental Radiography. 9th. Pearson, 2012, 978-0-13-801939-6.

23. Maximum enrollment.

12

24. Particular room type requirement. Is this course restricted to particular room type?

YES  
dental clinic

25. Special scheduling considerations. Are there special scheduling considerations for this course?

NO

26. Are special or additional resources needed for this course?

No

27. Does this course require special fees to be paid for by students?

NO

28. Does this course change the number of required credit hours in a degree or certificate?

29. Course designation(s) for the Liberal Arts A.A. degree and/or for the college's other associate degrees.

Degree	Program	Category
Associate in Arts:	Liberal Arts	LE - Elective
AS:	Allied Health - Dental Hygiene	PR - Program Requirement
AAS:		
BAS:		
Developmental/Remedial:		

30. Course designation(s) for other colleges in the UH system.

none however efforts will be made to align courses for UHMC dental hygiene graduates to attend UH Manoa for degree completion at the baccalaurate level (BSDH)

31. Indicate the year and page # of UHMC catalog referred to. For new or modified courses, please indicate the catalog pages that need to be modified and provide a sheet outlining those changes.

2014-2015 page 43 & 108

### 32. College-wide Academic Student Learner Outcomes (CASLOs).

<b>Standard 1 - Written Communication</b>	
Write effectively to convey ideas that meet the needs of specific audiences and purposes.	
Outcome 1.1 - Use writing to discover and articulate ideas.	1
Outcome 1.2 - Identify and analyze the audience and purpose for any intended communication.	1
Outcome 1.3 - Choose language, style, and organization appropriate to particular purposes and audiences.	1
Outcome 1.4 - Gather information and document sources appropriately.	2
Outcome 1.5 - Express a main idea as a thesis, hypothesis, or other appropriate statement.	1
Outcome 1.6 - Develop a main idea clearly and concisely with appropriate content.	2
Outcome 1.7 - Demonstrate a mastery of the conventions of writing, including grammar, spelling, and mechanics.	2
Outcome 1.8 - Demonstrate proficiency in revision and editing.	1
Outcome 1.9 - Develop a personal voice in written communication.	2
<b>Standard 2 - Quantitative Reasoning</b>	
Synthesize and articulate information using appropriate mathematical methods to solve problems of quantitative reasoning accurately and appropriately.	
Outcome 2.1 - Apply numeric, graphic, and symbolic skills and other forms of quantitative reasoning accurately and appropriately.	1
Outcome 2.2 - Demonstrate mastery of mathematical concepts, skills, and applications, using technology when appropriate.	1
Outcome 2.3 - Communicate clearly and concisely the methods and results of quantitative problem solving.	1
Outcome 2.4 - Formulate and test hypotheses using numerical experimentation.	1
Outcome 2.5 - Define quantitative issues and problems, gather relevant information, analyze that information, and present results.	1
Outcome 2.6 - Assess the validity of statistical conclusions.	1
<b>Standard 3 - Information Retrieval and Technology.</b>	
Access, evaluate, and utilize information effectively, ethically, and responsibly.	
Outcome 3.1 - Use print and electronic information technology ethically and responsibly.	1
Outcome 3.2 - Demonstrate knowledge of basic vocabulary, concepts, and operations of information retrieval and technology.	2
Outcome 3.3 - Recognize, identify, and define an information need.	2
Outcome 3.4 - Access and retrieve information through print and electronic media, evaluating the accuracy and authenticity of that information.	1
Outcome 3.5 - Create, manage, organize, and communicate information through electronic media.	1
Outcome 3.6 - Recognize changing technologies and make informed choices about their appropriateness and use.	2
<b>Standard 4 - Oral Communication</b>	
Practice ethical and responsible oral communications appropriately to a variety of audiences and purposes.	
Outcome 4.1 - Identify and analyze the audience and purpose of any intended communication.	2
Outcome 4.2 - Gather, evaluate, select, and organize information for the communication.	2
Outcome 4.3 - Use language, techniques, and strategies appropriate to the audience and occasion.	2
Outcome 4.4 - Speak clearly and confidently, using the voice, volume, tone, and articulation appropriate to the audience and occasion.	2
Outcome 4.5 - Summarize, analyze, and evaluate oral communications and ask coherent questions as needed.	2
Outcome 4.6 - Use competent oral expression to initiate and sustain discussions.	2
<b>Standard 5 - Critical Thinking</b>	
Apply critical thinking skills to effectively address the challenges and solve problems.	
Outcome 5.1 - Identify and state problems, issues, arguments, and questions contained in a body of information.	2
Outcome 5.2 - Identify and analyze assumptions and underlying points of view relating to an issue or problem.	2
Outcome 5.3 - Formulate research questions that require descriptive and explanatory analyses.	1
Outcome 5.4 - Recognize and understand multiple modes of inquiry, including investigative methods based on observation and	2

analysis.	
Outcome 5.5 - Evaluate a problem, distinguishing between relevant and irrelevant facts, opinions, assumptions, issues, values, and biases through the use of appropriate evidence.	2
Outcome 5.6 - Apply problem-solving techniques and skills, including the rules of logic and logical sequence.	1
Outcome 5.7 - Synthesize information from various sources, drawing appropriate conclusions.	1
Outcome 5.8 - Communicate clearly and concisely the methods and results of logical reasoning.	1
Outcome 5.9 - Reflect upon and evaluate their thought processes, value system, and world views in comparison to those of others.	1
<b>Standard 6 - Creativity</b>	
Able to express originality through a variety of forms.	
Outcome 6.1: Generate responses to problems and challenges through intuition and non-linear thinking.	1
Outcome 6.2: Explore diverse approaches to solving a problem or addressing a challenge.	1
Outcome 6.3: Sustain engagement in activities without a preconceived purpose.	1
Outcome 6.4: Apply creative principles to discover and express new ideas.	1
Outcome 6.5: Demonstrate the ability to trust and follow one's instincts in the absence of external direction	1
Outcome 6.6: Build upon or adapt the ideas of others to create novel expressions or new solutions.	1

### 33. Additional Information