

Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Department of Applied Dental Sciences
1st Semester

Course Information	
Course Title	Oral Radiology I
Course Number	ADS 351
Prerequisites	-
Course Website	-
Instructor	Zain A. Malkawi, <i>MSDH</i>
Office Location	M5L - 4/ Room # 17
Office Phone	00-9622-7201000 – extension: 23487
Office Hours	Monday, Wednesday : 1:00 – 2:00 PM
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Teaching Assistant	-
Course Description	
The study of the nature and production of X-rays, basic principles and procedures in oral radiology. Emphasis is on radiation physics, radiation biology, radiation protection, basic intraoral radiographic techniques, film processing and mounting procedures.	

Text Book	
Title	Dental Radiography. Principles and Techniques
Author(s)	Joen Iannucci Haring, DDS, MS & Laura Jansen, RDH, MS
Publisher	W.B. Saunders Co.
Year	2000
Edition	2 nd
Book Website	-
References	<i>Radiographic Interpretation for the Dental Hygienist</i> by JI Haring, & LJ Lind, WB Saunders Co. 1993

Assessment		
Assessment Type	Expected Due Date	Percentage
First Exam	Week 6	25%
Second Exam	Week 11	25%
Final Exam	Week 16	40%
Assignments	Week 14	5%
Participation	-	5%
Attendance	-	Each unexcused absence will result in reduction 1% from the final result of the continuous assessment grade.

Course Objectives	Percentage
1. Identify the radiation risk factors and assume the responsibility and the accountability for radiographic services.	20%
2. Demonstrate a competency in placing, exposing, processing, mounting, and criticize for acceptability of intra oral radiographs such as bitewing and periapical radiographs. 3. Discuss the rational for infection control and the dental radiographer.	25%
4. Apply techniques and utilize radiographic equipment which will provide clients with the maximum radiation protection	15%
5. Interpret an intra oral dental radiograph based on knowledge of the radiographic appearance of the tooth, tooth development, and supporting anatomical structures	20%
6. Evaluate and implement engineering controls and work practices in the dark room (processing room) for the purpose of infection control and ergonomics.	10%
7. Assess, plan, implement, and evaluate the quality assurance mechanisms for the purpose of obtaining a diagnostic radiographic imaging.	10%

Teaching & Learning Methods
Lecture/discussion, demonstration, and laboratory application.

Learning Outcomes: Upon successful completion of this course, students will be able to		
Related Objective(s)		Reference(s)
1	Identify the needs for requirements for controlled X-ray production based on knowledge of radiation biology.	Chapter 4 and Handouts
1 & 2	Demonstrating safe operation of dental X – ray equipment, which based on knowledge of radiation physics.	Chapter 2 and Handouts
3 , 4 & 5	recognizing the advantages, disadvantages and limitations of each type of the radiographic projection. Demonstrate effective communication with all individuals through timely completion of peer work group assignments and	Chapter 6, 7, 9, 13, 15, 17, 19, 20 and Handouts

	client – clinician role-play Describe infection control procedures that necessary prior, during and following x- ray exposure.	
4	Provide individualized care to the client by selecting the appropriate radiographic projection.	Chapter 5 and Handouts
5	Identify the difference between interpretation and diagnosis	Chapter 29 and Handouts
3 & 6	Identify the needs for requirements for controlling the work practices in the dark room (processing room). Discuss the infection control procedures that necessary for processing	Chapter 5 , 9 and Handouts
7	Discuss the quality control tests and quality administration procedures which included at the quality assurance plan.	Chapter 10 and Handouts

Useful Resources

Dento Maxillo Facial Radiology, A Journal of Head and Neck Imaging

Course Content		
	<i>Topic</i>	<i>Chapters in Text (Handouts)</i>
Week 1		
****	<ul style="list-style-type: none"> • Orientation to course ADS 325 	-
Week 2		
Lecture 1	<ul style="list-style-type: none"> • Radiographic Film ✓ Composition ✓ Classifications ✓ Intraoral Film ✓ Film Care & Storage 	<ul style="list-style-type: none"> • Class Activity: Film Packet Construction • Chapter 7
Lab 1	<ul style="list-style-type: none"> • Radiographic Film Processing ✓ Latent Image Formation ✓ Description of Radiographic Image ✓ Chemical Solutions ✓ Techniques for Time – Temperature Processing ✓ Darkroom design and requirements 	<ul style="list-style-type: none"> • Chapter 9
Week 3		
Lecture 2	<ul style="list-style-type: none"> • History • Radiation Physics ☒ Types of Radiation <ol style="list-style-type: none"> 1. Particulate 2. Electromagnetic 3. Ionizing • Source of Radiation Exposure • Characteristics of X- rays 	<ul style="list-style-type: none"> • Chapter 1 and 3

Lab 2	<ul style="list-style-type: none"> Dental X- Ray Equipment & Bite Wing techniques 	<ul style="list-style-type: none"> Reading Assignment Reference: <u>Dental Radiography. Principles and Techniques: p 290 – 304</u>
Week 4		
Lecture 3	<ul style="list-style-type: none"> Electricity of Dental Radiation Components of X- Ray Machine & Specific Function 	<ul style="list-style-type: none"> Chapter 6
Lab 3	<ul style="list-style-type: none"> Paralleling Technique for Anterior and Posterior Teeth ...I 	<ul style="list-style-type: none"> Reading Assignment Reference: <u>Dental Radiography. Principles and Techniques: p 220 – 243</u>
Week 5		
Lecture 4	<ul style="list-style-type: none"> Production of X – Rays <ul style="list-style-type: none"> 1. Requirements for Controlled Production 2. Process Characteristic Radiation Basic Interactions of Radiation with Matter <ul style="list-style-type: none"> 1. Photoelectric absorption 2. Compton Scattering Coherent Scattering 	<ul style="list-style-type: none"> Chapter 2
Lab 4	<ul style="list-style-type: none"> Paralleling Technique for Anterior and Posterior Teeth ...II 	<ul style="list-style-type: none"> Reading Assignment Reference: <u>Dental Radiography. Principles and Techniques: p 220 – 243</u>
Week 6	<i>First Exam</i>	<i>Study !!</i>
Week 7		
Lecture 5	<ul style="list-style-type: none"> Dental Radiographs and Dental Radiographer 	<ul style="list-style-type: none"> Chapter 11
Lab 5	<ul style="list-style-type: none"> Film Mounting and Film Viewing 	<ul style="list-style-type: none"> Reading Assignment Reference: <u>Dental Radiography. Principles and Techniques: p 445 – 448</u>
Week 8		
Lecture 6	<ul style="list-style-type: none"> Factors Affecting Radiographic Image <ul style="list-style-type: none"> A. Beam Factors B. Subject Factors C. Film Factors D. Geometric Factors 	<ul style="list-style-type: none"> Chapter 8
Week 9		
Lecture 7	<ul style="list-style-type: none"> Radiation Dosimetry...I <ul style="list-style-type: none"> A. Personnel Monitoring Devices 	<ul style="list-style-type: none"> Chapter 4

	<ul style="list-style-type: none"> B. Units of Radiation <ol style="list-style-type: none"> 1. Exposure 2. Absorbed Dose 3. Dose Equivalent 4. Radioactivity • Radiation Biology <ol style="list-style-type: none"> A. The Cell B. Ionization C. Theories Biol. Effect <ol style="list-style-type: none"> 1. Direct 2. Indirect D. Cellular Effects of Radiation E. Factors of Influencing • Biological Respons 	
Lab 6	<ul style="list-style-type: none"> • Dental Radiographic Exposure Variables 	<ul style="list-style-type: none"> • Reading Assignment Reference: <u>Dental Radiography. Principles and Techniques: p 316 – 318</u>
Week 10		
Lecture 8	<ul style="list-style-type: none"> • (Radiation Biology – Continued)...II <input checked="" type="checkbox"/> Latent Period <input checked="" type="checkbox"/> Somatic and Genetic Effects <input checked="" type="checkbox"/> Dose Response Curves <input checked="" type="checkbox"/> Comparative Radiosensitivity <input checked="" type="checkbox"/> Distribution and dose levels 	<ul style="list-style-type: none"> • Chapter 4
Week 11	Second Exam	Study !!
Week 12		
Lecture 9	<ul style="list-style-type: none"> • Radiographic Anatomy of the Maxilla 	<ul style="list-style-type: none"> ▪ Reading Assignment: Reference: <u>Radiographic Interpretation for the Dental Hygienist</u> : p 26 – 57
Lab 7	<ul style="list-style-type: none"> • Bony Landmarks of the Mandible 	<ul style="list-style-type: none"> ▪ Reading Assignment: Reference: <u>Radiographic Interpretation for the Dental Hygienist</u> : p 26-57
Week 13		
Lecture 10	<ul style="list-style-type: none"> • Radiation Protection: <input checked="" type="checkbox"/> Patient Protection <input checked="" type="checkbox"/> Operator Protection 	<ul style="list-style-type: none"> • Chapter 5
Lab 8	<ul style="list-style-type: none"> • Exposure and Technique Errors and Processing Problems 	<ul style="list-style-type: none"> • Chapter 20
Week 14		
Lecture 11	<ul style="list-style-type: none"> • <i>Quality Assurance of Dental Radiographs at Dental office</i> 	<ul style="list-style-type: none"> • Reading Assignment Reference: <u>Dental Radiography. Principles and Techniques: p 161</u>

Week 15		
	<i>Prepare for the Final Exam</i>	
Week 16	Final Exam	Study !!

Additional Notes	
Assignments	1. All course related assignments are to be submitted to the course instructor on the established due dates. Work submitted after the established deadlines will be penalized by the grade. Students are encouraged to keep a duplicate copy of all written assignments submitted. (1) Days late minus -1% , (2) Days late minus 2% ...etc.
Exams	2. Examinations cover lectures, class work, handouts and laboratory assignments.
Cheating	3. All academic work submitted to fulfill a course requirement is expected to be result of each student's own thought, research and self-expression. A student will have committed plagiarism if he/she reproduce someone else's work without acknowledging its source. Examples of sources which must be acknowledged include: published articles, chapters of books, computer programs, graphics representations, research papers, and any other kinds of work from a source not so generated to be part of the public domain. The student will be penalized regarding to JUST regulations. If the student has been suspended as a cheater during a course exam, the student will receive a zero at that exam and will receive a Notice from the chair of the department.
Attendance	4. Applied Dental Sciences Department has expectation of 100% attendance. Each unexcused absence will result in reduction 1% from the final result of the continuous assessment grade. Tardiness by (10) minutes or more will be counted as an absence. <ul style="list-style-type: none"> ▪ Excused absence: should be combined with a note from a physician, or other appropriate individual must be submitted to constitute an excused absence. ▪ Students who <u>do not</u> take exams during the scheduled dates are to follow the steps below: <ol style="list-style-type: none"> 1. Schedule a meeting with instructor 2. Have ready documentation of excused absence. If absence is unexcused, student will receive a grade Zero (0) for the exam not taken. 3. For excused absence, take make-up exam as soon as possible. Make-up exam will cover same course content as scheduled exam. Exam format will be decided by instructor. Possible formats will include but not limited to: <ol style="list-style-type: none"> a) Oral exam b) Essay c) Short answer d) Listing

	e) Demonstration/performance f) Combination of the previous mentioned formats
Workload	-
Graded Exams	-
Participation	Class participation, meaningful class discussion, homework, and group activities are required
Laboratory	<ul style="list-style-type: none"> ▪ Each student is required to wear the Radiation Monitoring Badge (To be supplied through the Office of Royal Scientific society) ▪ The student is expected to place, expose, process, mount, and critique each radiographic series. • Each student is required to have his/her own <u>Magnifying Glass</u> for <u>Dental Radiographic Interpretation Purpose</u>. ▪ <u>Equipment Maintenance and Laboratory Assistant Responsibilities</u>: After use of the radiology equipment, all students are required to secure all equipment. • Please turn off all cell phones during class. <p><u>Dress Code:</u></p> <ul style="list-style-type: none"> • Dress Code: Students are required to be prepared with their clinic coat, tagname, and protective eyeglasses in each laboratory work. Long hair should be tied. And short skirts, jeans, jewelries, long nails, open high heel shoes and sandals are not permitted in the dental clinic and during the laboratory work.
Projects	-

radiography - Extraoral radiography -- Digital radiography -- Radiography of patients with special needs -- Normal anatomy: intraoral films -- Film mounting and film viewing -- Normal anatomy: panoramic films -- Introduction to radiographic interpretation -- Interpretation of dental caries -- Interpretation of periodontal disease -- Interpretation of trauma and pulpal and periapical lesions.