SYLLABUS

COURSE:	DHCT 3205 Dental Radiology II
SEMESTER:	Spring
CREDIT HOUR:	1.0
FIRST EDITION:	2002
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COURSE DIRECTOR:	Kenneth Abramovitch D.D.S., M.S.

GOAL

The purpose of this course is to introduce the dental hygiene student to the basic principles of extra-oral imaging and specialized techniques in oral and maxillofacial radiology. In conjunction with the clinical examination, the radiographic examination plays an integral role in the diagnostic process in dentistry. The dental hygienist must be proficient in certain extraoral techniques such as panoramic radiology. It is also important that they be knowledgeable in other imaging techniques to fulfill their roles as health care providers.

As part of the health care team, dental hygienists must have an understanding of the basic concepts of the various extraoral imaging modalities and specialized techniques. This ultimately assists with the overall patient care management. The preclinical laboratory sessions are designed to perfect your technical skills and familiarize you with the variability of the normal radiographic anatomy on panoramic, skull and occlusal radiographs.

OBJECTIVES

I. EXTRAORAL RADIOGRAPHY

1. Describe the arrangement of screens and film within an extraoral cassette. (p.101-102)

2. Describe the indirect use of x-radiation for exposing dental radiographs via intensifying screens. (p. 101, 365)

3. List the component layers of an intensifying screen and state their function. (p. 101)

4. Differentiate between the two types of phosphors commonly used in intensifying screens based on:

   a) the type of light fluoresced (p. 101)
   b) efficiency (p. 101)

5. State the different screen-film compatibilities for regular and rare earth phosphors. (p.100)

II. PANORAMIC RADIOGRAPHY

1. Compare and contrast the advantages and disadvantages of panoramic radiography. (Lecture notes)

2. Compare the relative somatic dose to the patient for a panoramic survey versus an FMS. (Lecture notes)

3. List 5 different distortional effects encountered in panoramic radiography. (Handout)

4. Define the "ghosting" phenomenon and describe how these ghost images are projected on a panoramic radiograph. (Handout)

5. Define the "focal trough" (a.k.a. image layer; zone of sharpness; sharply depicted zone). (p.345)

6. Describe how the focal trough is affected by alterations in the centers of rotation. (Handout)

7. Differentiate between how a stationary (fixed) center of rotation versus the continuously moving centers of rotation affect the panoramic image. (Handout)

8. Describe the path of rotation of the radiation source, the cassette carriage and the film cassette around the patient's head. (p. 343-34)

9. List three (3) midline anatomic areas that are projected bilaterally on the panoramic image and state the reason why this occurs. (Handout)

10. List three (3) midline anatomic areas that are projected as single images on the panoramic film and state the reason why this occurs. (Handout)

11. Identify the following anatomic areas on a panoramic radiograph. (Handout)

a.	mid-cranial fossa	k.	zygomatic arch
b.	angle of mandible	l.	pterygoid plate
c.	articular eminence	m.	maxillary sinus
d.	mandibular condyle	n.	styloid process
e.	maxillary tuberosity	o.	mental foramen
f.	external oblique line	p.	mandibular canal
g.	septa in maxillary sinus	q.	coronoid process
h.	orbit	r.	palate
i.	ear lobe	s.	vertebra
j.	hyoid bone	t.	glenoid fossa

12. State the patient preparation procedures necessary before positioning a patient in the panoramic machine. (Handout)

13. State four (4) critical patient positioning requirements in the panoramic unit. (Handout)

14. Describe the error on the panoramic image that results from the postural position in a panoramic unit: (Handout)

a) -patient is positioned anterior to the focal trough
-patient is positioned posterior to the focal trough

b) -midsagittal plane is off center
-patient is not facing forward but off to either side

c) -patient's chin is too high
-patient's chin is too low

d) -patient's neck-shoulder posture is slumped

15. State three (3) instructions that each patient should be given prior to exposing a panoramic radiograph. (Handout)

16. Identify the following errors when demonstrated on a panoramic radiograph. State the cause and correction of each problem. (Handout)

a. radiopaque ghost obscuring the lower center of the film
b. radiopaque images or ghosts obscuring either side of center or the lower center of the film
c. unusual or atypical radiopaque images
d. radiolucent shadow obscuring the apices of maxillary teeth
e. blurred and wide anterior teeth
f. blurred and thin anterior teeth
g. radiopaque palate obscures apices of maxillary teeth
h. flat or reversed occlusal curvature ("smile line")
i. exaggerated occlusal curvature ("smile line")
j. condyles and/or lower border of chin projecting off edge of the film
k. unequal proportions of contralateral posterior teeth
l. film too dark
m. film too light

III. SPECIAL VIEWS and TECHNIQUES

1. List the advantages of occlusal radiography. (Handout)

2. List the six (6) different views utilized for occlusal radiography. (Handout; pp. 326)

3. List the film sizes used in occlusal radiography and state the rationale for using this type of film size. (pp. 98)

4. State the head position, film position, vertical angulation, horizontal angulation and point of entry of the central ray for each occlusal projection. (Handout)

5. List two image characteristics that help to differentiate the maxillary cross-sectional occlusal view from the maxillary anterior topographical view. (Lab and lecture notes)

6. List the two image characteristics that help to differentiate the mandibular cross-sectional occlusal view from the mandibular anterior topographical view. (Lab and lecture notes)

7. Name and briefly describe the techniques most frequently used in dental radiography to obtain three-dimensional information.

8. Describe now Clark's rule ("Slob") can help you in examining conventional full mouth radiographic films.

9. List three (3) indications for using the lateral jaw survey. (Lab and lecture notes)

10. List the two (2) types of lateral jaw survey projections. (Lab and lecture notes)

11. State the head position, film placement, vertical angulation, horizontal angulation and point of entry of the central ray for 2 types of lateral jaw surveys. (Handout)

12. Identify the following skull radiographs:

    a. lateral skull projection (Radiology Clinic)
    b. PA skull radiograph (Radiology Clinic)
    c. Water's projection (Radiology Clinic)
    d. submentovertex program (Radiology Clinic)

13. State the head position, film placement, vertical angulation, horizontal angulation and point of entry of the central ray for the:

    a. lateral skull projection (Handout)
    b. PA skull projection (Handout)
    c. Water's projection (Handout)
    d. submentovertex projection (Handout)

14. List the purpose of a lateral skull cephalometric radiograph. (p. 370)

15. Differentiate the patient positioning criteria between a PA skull radiograph and an AP skull radiograph. (Lecture notes)

16. State the main indication for the Waters' skull projection. (Lecture notes)

17. List indicators for the PA skull projection.

18. List indicators for the SMV skull projection.

19. List the two types of temporomandibular joint radiographic surveys that can be taken with standard dental operatory radiographic equipment. (Handout; lecture notes)

20. Name two (2) types of positive contrast examinations useful in dentistry. (Handout)

21. State the type of patient allergy that would contra-indicate a standard positive contrast examination. (Handout)

22. Define "arthrography." (Handout)

23. State the type of information that can be determined from TMJ arthrography. (Handout)

24. List three types of radiographic procedures that are useful for TMJ arthrography. (Handout)

25. Define "sialography." (Handout)

26. State which salivary glands can be examined by sialography. (Handout)

27. State the type of information that can be determined from a sialographic study. (Handout)

28. List the advantages and disadvantages of:

    a. conventional tomography (Handout)
    b. computed tomography i.e., CT (Handout)
    c. magnetic resonance imaging i.e., MRI (Handout)
    d. nuclear scans (Handout)

29. Identify the two methods of acquiring radiographic images in digital form.

30. Compare the following direct digital radiography systems:

    30.1 charged-coupled device (CCD)
    30.2 photostimulable phosphor plate (PSP)

31. Identify advantages and disadvantages of digital technology as it relates to radiology.

IV. <u>QUALITY ASSURANCE</u>

1. Define quality assurance. (Handout)

2. List the four (4) areas that require monitoring in a quality assurance program. (Handout)

3. List the parameters that should be periodically tested for the x-ray generating equipment. (Handout)

4. State the correct safelighting requirements for the darkroom. (Handout)

5. List three (3) advantages and three (3) disadvantages of automatic processors. (Handout; pp. 136-138, 158-160)

6. State two uses for the x-ray checker (i.e., stepwedge device). (Handout; p. 158-160)

7. Describe the rationale for a Quality Administration program. (Handout)

V. INFECTION CONTROL IN DENTAL RADIOLOGY

1. Describe the reason that infection control is necessary for radiographic procedures.

2. List the modes of disease transmission seen in clinical procedures.

3. List the types of instrument classifications used that are dependent on the risk of transmitting infection and the need to sterilize them.

4. State the instruments used for intraoral radiography that require sterilization.

5. State the infection control policy regarding the use of protective eyewear and facial masks for intraoral radiography.

6. List the surfaces in the radiology cubicle and adjacent the radiology cubicle that require barrier protection.

7. Describe the two types of infection control procedures for dental film.

8. State the infection control protocol used in the darkroom(s) of the Dental Branch radiology clinics.

RESOURCES

I. Media Resources

A. Printed Media

1. Required textbook

Haring, J.I. and Jansen, L.J.
Dental Radiography, Principles and Techniques, 2nd Ed.
W.B. Saunders Company 2000, 569p

Langlais, R.P.
Exercises in Oral Radiography and Interpretation, 4th Ed.
W.B. Saunders, 2004, 381p.

2. Supplemental textbook

Kasle, M. J.
Atlas of Dental Radiographic Anatomy
4th Ed. WB Saunders, Philadelphia, PA 1994

Several copies of this text and previous editions are available at the UTDB library for room use (reserved copies) and for 2-week loans (stack copies).

B. Audiovisual

1. Slides

Students are strongly encouraged to view these reference slide series in the Learning Resource Center (LRC), Room 341.

1. Kodak Dental Radiography Series: *Extraoral Radiography*

2. Kodak Dental Radiography Series: *Quality Control for Dental Imaging*

II. Human Resources

Kenneth Abramovitch, DDS, MS — *Course Director*
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STUDY PLANS AND REQUIREMENTS

This course is to be completed by the end of the spring semester of the first year of the dental hygiene program.

ATTENDANCE

You must attend all lectures and the lab sessions to which you are assigned. Punctuality is essential; we have limited facilities and the scheduling is complex. We therefore regret that the laboratory sessions cannot be re-assigned. Each lab session is of one-hour duration.

You will be penalized for any unexcused absence as stipulated in the evaluation methods.

The schedules for the lectures and lab sessions are listed on the following two pages. Laboratory sessions will be held either in the Radiology Clinic area or in Room 303.

To prepare for this course:

1. Review the objectives.
2. Study the appropriate sections in *Dental Radiography, Principles and Techniques,* 2nd ed.; by Haring, J.I., and Jansen, L.J.
3. Pay particular attention to all illustrations found in these sections of your text.

SPECIAL PROJECT

As part of the course requirement, each student will be required to complete a special project. Details will be announced later in the semester.

DH 3205 DENTAL RADIOLOGY II
2007 Spring Semester Lecture Schedule

Day/Time: Tuesdays, 10 -10:50 am

DATE	SESSION TOPICS	REFERENCE TEXTS
1 - Jan 02	Extraoral Radiography	1) pp. 99-102, 348-349, 364-365
2 - Jan 09	Theory and Principles of Panoramic Radiography	1) pp. 342-348, 357-359; Handout
3 - Jan 16	Panoramic Image and Biologic Effects	1) p. 344; Handout
4 - Jan 23	Panoramic Technique	1) pp. 349-352 ***** pp. 112-127 2) pp. 29-31
5 – Jan 30	Common Panoramic Errors I	1) pp. 352-357 2) Chapters 6 & 7; Handout
6 - Feb 06	Common Panoramic Errors II	1) pp. 352-357 2) Chapters 6 & 7; Handout
7 - **Wed, Feb 14** **9 - 9:50 am**	**Examination - Written** (25%)	**Room 207**
8 - Feb 20	**Examination - Film Recognition** (15%)	**Room 207**
9 – Feb 27	Occlusal Radiography & Localization Techniques	1) pp. 98, 324-341 2) p. 28 ***** pp. 96-101; Handout
10 - Mar 06	Mandibular Radiography	1) pp. 367-370 ***** pp. 104-111; Handout
11 - Mar 13	**NO CLASS**	
Mar 20	**SPRING BREAK**	
12 - Mar 27	Skull Radiography	1) pp.370-381 ***** 129-141
13 - Apr 03	Digital Radiography	1) pp. 384-396 2) Chapter 5; Handout
14 - Apr 10	Specialized Techniques	Handout
15 - Apr 17	Quality Assurance	1) pp. 154-162; Handout
16 - Apr 24	Review Session ***Course Evaluation***	
May 2 **8:00 - 9:50 am**	**Final Examination** (50%)	**Room 207**

*Kasle, M. J., *Atlas of Dental Radiographic Anatomy,* 4th Ed. WB Saunders, Philadelphia, PA, 1994

DH 3205 DENTAL RADIOLOGY II
2007 Spring Semester Laboratory Schedule

Day/Time: Tuesdays, Wednesdays, Thursdays & Fridays (8-8:50 am)

DATE	DAY	GROUP	TOPIC	ROOM
01/02	Tues	A	Infection Control	Clinic
01/03	Wed	B	Infection Control	Clinic
01/04	Thurs	C	Infection Control	Clinic
01/05	Fri	D	Infection Control	Clinic
01/09	Tues	A	Infection Control	Clinic
01/10	Wed	B	Infection Control	Clinic
01/11	Thurs	C	Infection Control	Clinic
01/12	Fri	D	Infection Control	Clinic
01/16	Tues	A	Clinical Radiography I	Clinic
01/17	Wed	B	Clinical Radiography I	Clinic
01/18	Thurs	C	Clinical Radiography I	Clinic
01/19	Fri	D	Clinical Radiography I	Clinic
01/23	Tues	A	Clinical Radiography II	Clinic
01/24	Wed	B	Clinical Radiography II	Clinic
01/25	Thurs	C	Clinical Radiography II	Clinic
01/26	Fri	D	Clinical Radiography II	Clinic
01/30	Tues	A & C	Evaluating Radiographs	303
01/31	Wed	B & D	Evaluating Radiographs	303
02/06	Tues	A & C	Panoramic Recognition	303
02/07	Wed	B & D	Panoramic Recognition	Clinic
02/13	Tues	A & C	Panoramic Errors	303
02/14	Wed	B & D	Panoramic Errors	303
03/06	Tues	A	Occlusal Radiography I	Clinic
03/07	Wed	B	Occlusal Radiography I	Clinic
03/08	Thurs	C	Occlusal Radiography I	Clinic
03/09		D	**Grp D will be divided among the three previous days.**	
03/13	Tues	A	Occlusal Radiography II	Clinic
03/14	Wed	B	Occlusal Radiography II	Clinic
03/15	Thurs	C	Occlusal Radiography II	Clinic
03/16	Fri	D	Occlusal Radiography II	Clinic
04/03	Tues	A & C	Skull Radiography	Clinic
04/04	Wed	B & D	Skull Radiography	Clinic
04/10	Tues	A	Digital Radiography	Clinic
04/11	Wed	B	Digital Radiography	Clinic
04/12	Thurs	C	Digital Radiography	Clinic
04/13	Fri	D	Digital Radiography	Clinic

Skull Radiology Lab

Goals:

1. To familiarize students with the film placement and patient positioning required for skull radiography.

2. To familiarize students with extraoral radiographic equipment.

Procedures:

Students will be required to work in groups of 4 or 5 students.
Use the technique chart below to produce the following four skull radiographs.

1. Lateral skull
2. PA skull
3. Waters'
4. Lateral Oblique

Technique chart for Skull Radiography

View	Focal Spot - Film Distance	Mid-Sagittal Plane	Frankfurt Plane	Point of Entry for Central Ray	Settings
Lateral	60"	Parallel to film	Parallel to floor	External Acoustic Canal	70kV / 7mA / .25 sec
PA Skull	60"	90^0 to film	Parallel to floor	Occipital Protuberance	70kV / 7mA / .32 sec
Waters'	60"	90^0 to film	45^0 to floor	Occipital Protuberance	70kV / 7mA / .32 sec
Lateral Oblique	30"	oblique	30^0 to floor	2" below opposite mandibular border; aim towards ramus	60kV / 7mA / .06 sec

Evaluation:

At the end of the lab, each group of students should complete a Skull Radiography Technique Evaluation Form. The form must be signed and turned in by the end of the session:

1. Identity the different skull radiographs.

2. Critique skull position for each view.

3. Critique any exposure and / or processing errors that may be present.

EVALUATION METHODS

LECTURE

There will be two mid-term examinations and a final comprehensive examination for this course. The material on the examinations will include all information pertinent to oral and maxillofacial radiology as covered in the lecture series and reference pages.

LABORATORY

Students are expected to complete all lab exercises in order to obtain a final course grade. Penalty points will be deducted from the final grade for each incomplete lab assignment to a maximum of 30% of the final course grade.

ATTENDANCE

Attendance is mandatory for all lectures and lab sessions. A student will be penalized for any lecture or lab session missed without an excused absence as determined by the current *School of Dental Hygiene Student Handbook.*

GRADES

The course grade will be assigned according to the following criteria:

1) Examination - Written	20%
2) Examination - Film Recognition	15%
3) Final Examination	50%
4) Special Project	10%
5) Attendance	5%
TOTAL	100%

APPENDIX